HOUSE OF LORDS SESSION 1995–96

SELECT COMMITTEE ON
SCIENCE AND TECHNOLOGY

INFORMATION SOCIETY:

AGENDA FOR ACTION IN THE UK

EVIDENCE RECEIVED AFTER 31 MARCH 1996

Printed pursuant to the Order of the House of Lords *of 21 November 1995*

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CALL FOR EVIDENCE

The Sub-Committee invite written submissions on matters of relevance to this topic, but in particular on the questions listed below.

Note: For the purposes of this enquiry the term "Information Superhighway" has been taken to mean a publicly accessible network capable of transferring large amounts of information at high speed between users.

1. What is the current form of the "Information Superhighway", and how is it developing (i) in the United Kingdom and (ii) worldwide? What specific problems arise from incompatible network standards and why are these incompatibilities arising?

2. What services are being provided, and should be developed/will be required, within for example the following areas:

(i) public information,
(ii) commerce,
(iii) finance,
(iv) education,
(v) industrial training,
(vi) health,
(vii) social services, and
(viii) entertainment?

3. Who will supply these services to consumers in the United Kingdom? How can the participating companies be categorised and what is the nature of the commercial relationships between them? How are suppliers likely to develop? What *service* standards exist and how are they likely to evolve?

4. How can universal access to services provided for the common good be secured within a commercially competitive market framework?

5. What is the role of central Government in connection with the "Information Superhighway" service provision, including the following areas:

(i) leadership;
(ii) promoting inward investment;
(iii) promoting and safeguarding the interests of UK firms worldwide;
(iv) promoting network compatibility;
(v) access to Government information;
(vi) security of payment;
(vii) data protection, confidentiality and censorship;
(viii) verification of information; and
(ix) promoting the development of UK-orientated software?

6. What is the role of local and regional Government in connection with the "Information Superhighway"? How can new services be used to boost (a) the ongoing regeneration of urban areas, (b) other local economies?

7. What will be the impact of the "Information Superhighway" on working practices and employment prospects?

8. Is the dominance of mass-market US software a threat or an opportunity? What hard *commercial* initiatives can be made (as opposed to "collaborative" ventures such as RACE or ESPRIT) to respond to this dominance?

MEMBERSHIP OF SUB-COMMITTEE I

Lord Butterworth
Lord Craig of Radley GCB OBE
Lord Flowers FRS
Lord Gregson
Lord Haskel
Baroness Hogg
Lord Hollick
Lord Phillips of Ellesmere KBE FRS (Chairman)

SPECIALIST ADVISER

Professor Charles Oppenheim

TUESDAY 16 APRIL 1996

Present:

Butterworth, L.	Hogg, B.
Craig of Radley, L.	Hollick, L.
Flowers, L.	Phillips of Ellesmere, L. (Chairman)
Haskel, L.	

Memorandum by the British Medical Association

EXECUTIVE SUMMARY

The BMA welcomes the opportunity to submit evidence to members of Sub Committee I on the applications in society of the information superhighway. In considering the guidance prepared by the Sub Committee we found that the questions upon which evidence was sought related primarily to the applications of information technology to commercial business and industry. We have, therefore, in this evidence attempted to draw attention to the application of information networks to our prime areas of interest, the National Health Service and patient care. In particular, we have emphasised our concerns over the operation of the information networks within the NHS.

1. *What is the current form of the "Information Superhighway" and how is it developing (i) in the UK and (ii) worldwide? What specific problems arise from the incompatible network standards and why are these incompatibilities arising?*

Both worldwide and in the UK the "Information Superhighway" may be described as an ever-increasing and constantly changing "network of networks". Currently this means linked server computers and routing structures which allow information to be transferred between computers which have access to a telephone line and minimal software. Information can be transferred immediately or stored for collection at a later time. Sub-structures can be developed within a network and these can be accessed by other computer users.

DEVELOPMENT IN THE UK

We are aware of numerous service systems all of which are, or can be interconnected. These are operated by companies, industrial bodies, academic institutions and also within the NHS. Development has seemed to occur in a protean way as more computer users gain access to the network. Within the National Health Service, the NHS Executive's Information Management Group (IMG) has recently launched "HealthNet", an NHS-Wide Network planned to link regional health care networks throughout England and which will also link (with the protection of a firewall, the technical details of which have been protected from public scrutiny) to the wider information superhighway. Such developments provide a messaging system which will give increasing numbers of people access to a service by-passing the main telecommunications agencies and postal systems. It will also act as a large information data base giving users access to information previously unavailable except to those in the particular professions involved, eg, medicine, law.

WORLDWIDE DEVELOPMENT

We believe that the information superhighway is also developing exponentially across the world. As the only limitations are access to a telephone line, a basic computer and the appropriate resources we see in the near future the Internet and the telephone becoming effectively synonymous.

SPECIFIC PROBLEMS

Problems arise from incompatible technical standards and incompatible user preferences. We are aware that difficulties relating to both network hardware and software, due to incompatible network standards, exist within the UK health care community, and specifically with regard to communications. Incompatibilities exist, not least as a result of the wide variety and age of hardware/software developed for use in the many health care sectors within the UK. The UK market in health care information technology has a history of being supplier-led and a subsequent tendency toward a diversity of proprietary hardware/software products. One example of this is the incompatibilities which exist between the national EDIFACT standard messages system using READ coding (representing a compatible standard) and the current links between general practitioners practices and laboratories or local area networks which are based on e-mail and plain text standards.

REASONS FOR INCOMPATIBILITY

We believe that in the NHS such incompatabilities are arising primarily as a result of local systems being developed by non-experts using inexpensive hardware and software, which whilst satisfying short term needs has created long term problems. By contrast the National EDIFACT standard is complex and requires a long term national plan and implementation strategy to ensure it works effectively and efficiently. We are concerned that the lack of clear advice from the Department of Health on this is hindering the development of this national standard and thus encouraging the growth of cheaper, less efficient local alternatives. The BMA has supported moves towards open systems technology and the development of proprietary hardware/software which share common standards so that they may easily communicate with one another. We also have continued to emphasise the need for future developments in health care technology to be steered by health care professionals themselves.

2. *What services are being provided, or should be developed or will be required, within certain areas, for example, the health service.*

The BMA is only able to comment here only on developments within the National Health Service and would wish to draw attention to the NHS Information Management & Technology Strategy which provides a national plan aimed at developing the use of information within the NHS. We are very concerned that the strategy represents many loosely connected aims, the majority of which are laudable, but they do not appear to be supported by an adequately resourced strategy for implementation. We believe that this has resulted in considerable uncertainty and a lack of clear direction. We also fear that a lack of understanding exists within the service of both the impact and demands that information technology imposes on an organisation as large and diverse as the NHS. There appear to be major uncertainties as to how benefits of such technology will contribute to the care of patients as well as the management of the organisation itself.

The BMA believes that the development of current and future services in the health sector may be divided into:

Services not handling identifiable patient information:

Access to and organisation of the health care literature.

Access to knowledge bases for decision support in health care.

Multimedia, interactive teaching and learning in health care.

Bulletin boards and new groups focusing on general and more specific aspects of health care.

Services handling identifiable patient information:

Sharing of patient information between those health care professionals directly involved in the care of that patient.

The practice of tele-medicine eg computer conferencing, computer diagnosis, remote surgery.

Services which currently handle identifiable patient information but which should not handle this type of data:

Administration of the newly developed internal market structure of the NHS.

Epidemiological research, without the express consent of the individuals concerned.

3. *Who will supply these services to consumers in the UK? How can the participating companies be categorised and what is the nature of the commercial relationships between them? How are suppliers likely to develop? What service standards exist and how are they likely to evolve?*

The services may be provided both commercially and non-commercially on a co-operative basis. Both will be offered from a wide range of different sources including academic institutions, primary and secondary care institutions, professional organisations, patient organisations and private industry. The BMA has expressed grave concern in connection with the intention to provide services to the health care sector through the NHS-Wide Network "HealthNet" and we explain this in more detail in our evidence to question 5.

4. *How can universal access to services provided for the common good be secured within a commercially competitive market framework?*

We believe that by recognising that information (eg, health care information) has a value, it could be possible then to view this within a competitive market framework. It should be possible to develop a system, within the internal market structure of the new NHS, whereby the necessary infrastructure for the creation, storage, retrieval and manipulation of health care information is budgeted and further managed as any other essential resource. Funds would need to be allocated not only to those providing the hardware, software and other necessary communications architecture for Internet connectivity but also to those professionals who create and critique the intellectual content of the information sources to be made available. This aspect of provision of care and marketing could be seen as a integral part of the quality of both commissioning and provision of services. This must be integrated however with the original and still overwhelming ethos of the "Information Superhighway" of free communications and information exchange for all. It is necessary that certain basic information eg Government health legislation, health promotional materials be made freely available via the "Information Superhighway" to everyone, health professionals and public alike.

5. *What is the role of central Government in connection with the "Information Superhighway" service provision.*

The BMA believes that the Government has a full and crucial role to play in all the areas suggested by the Sub Committee. We believe that central Government has to provide leadership so that the gains that will be accrued from the widespread use of information technology will be maximised. The BMA has, in particular, been concerned with the security and confidentiality aspects of the NHS "HealthNet". The BMA believes that the current security policy and technical specifications for the "HealthNet" fulfil neither the professions' requirement nor the public's demand for confidentiality of identifiable health data. This is despite months of painstaking effort and investment in negotiation by the BMA with the NHS-Executive's Information Management Group (IMG). The BMA is particularly concerned about the levels of access to the network, ie, the amount of information that any one *authorised* individual may have available to them at a particular time and that the technical specifications for the planned HealthNet link with the wider "Information Superhighway" are not being made publicly available and thereby available for comment by technical experts. We are seriously concerned at the level of recognition within the NHS Executive of the importance of the absolute confidentiality of patient data and believe that the ability of individuals to access data quickly and easily within the system means that the only guaranteed way to maintain patient confidentiality is now not to enter electronically any confidential information given to a doctor at all. We have also proposed other strategies such as the encryption of data before it leaves the clinician's control. The BMA has also emphasised to the Department of Health its concern over the NHSE's insistence that the responsibility for the safety of the data within the HealthNet rests with the clinician who inputs the data. If the data is then to be accessible by many employees over which the clinician could not conceivably have either knowledge or control, then another incentive exists simply not to use electronic data in medicine and initiatives flounder.

Dr Ross Anderson, lecturer in computer and communications security at the University of Cambridge was commissioned by the BMA to produce a draft security policy and interim end-user guidelines. An article was published in the BMJ[1] of 13 January 1996 to stimulate discussion with the wider medical and security profession.

6. *What is the role of local and regional Government in connection with the "Information Superhighway"? How can new services be used to boost (a) the ongoing regeneration of urban areas, (b) other local economies.*

The BMA sees the role of local Government in connection with the "Information Superhighway", regeneration of urban areas and health care particularly in terms of its contribution toward community care, epidemiological research, the practice of preventive medicine and the health impact of local service development eg access to sports facilities, housing and other social benefits.

7. *What will be the impact of the "Information Superhighway" on working practices and employment prospects?*

The BMA believes that access to the "Information Superhighway" from machines that are not linked to networks carrying identifiable clinical information, could impact on clinical practice in many ways, contributing to the overall clinical audit process leading to improved patient care based on evidence of best practice. However, the impact of the information superhighway on NHS working practices up to now has been to add administrative tasks rather than improving clinical results or output. We believe that any information strategy should be developed by managers and end-users liaising closely to ensure a satisfactory end result.

We see information technology leading to an increased ability to share information between those directly involved in the care of a particular patient with their express consent. It is the BMA's view that situations where information may be shared without the patient's consent should be defined by law. A draft Bill on confidentiality of healthcare information, has been produced by a multi-disciplinary group led by the BMA and it is hoped that this will soon appear before Parliament. We can also envisage information technology leading to the development of tele-medicine techniques and practices. The use of literature search tools, knowledge bases to aid decision support in medicine and multi-media, interactive teaching and learning packages will assist in promoting the further development and practice of evidence-based medicine. In practice patients will be able to access information with appropriate help and support and clinicians will be able to share experiences of rare conditions, with the safeguard of anonymised patient data. The provision of improved collection of statistical data and means of analysis for the purposes of clinical audit and epidemiological research will assist those who practice preventive medicine.

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[1] Anderson R, Clinical system security: interim guidelines, BMJ, 1996 312, 109-111.

8. *Is the dominance of mass-market US software a threat or an opportunity? What hard commercial initiatives can be made (as opposed to collaborative ventures such as RACE or ESPRIT) to respond to this dominance?*

Funding is required from both the public and private sectors to support UK initiatives in the development and evaluation of hardware/software for use in health care. We believe that this activity is currently in need of a central focus for both clinicians and those from the IT industry. The BMA has proposed the establishment of a National Centre for Medical Informatics to take on this role and we believe that software suppliers in the UK health care market will be supported in the market place if the NHS embraces a security policy which reflects the ethical precepts of confidentiality of health data and the requirement for informed consent before identifiable data is shared.[2] This would give British suppliers a platform to develop effective, internationally marketable clinical systems.

It is essential that the Government develop collaborative rather than confrontational approaches to consultation with health care professional organisations and clinical informaticians to produce policy and strategy and develop products that are ethically acceptable to health care professionals and patients. Government departments concerned with the specification and project management of implementing information systems must demonstrate that they are accessing the highest academic, technical and professional levels of expertise to ensure prudent investment of public money. We also believe that independent evaluation processes (at a high level of competence in the discipline of data security) must be agreed to validate hardware and software.

17th January 1996

Examination of Witnesses

Dr A W Macara, Chairman of Council, Dr Simon Jenkins, Chairman, BMA Information Technology Committee, Dr Colin Smith, Chairman, BMA Medical Academic Staff Committee, and Dr Ross Anderson, Consultant to the BMA, Lecturer, Computer Laboratory, University of Cambridge, British Medical Association, called in and examined.

406. Good morning, Dr Macara and colleagues. Perhaps you would like to introduce yourselves and your colleagues and make whatever introductory statement you think might most help us?

(*Dr Macara*) Thank you, my Lord Chairman. May we first of all thank you for the opportunity to give oral evidence. We have a well rounded team. I am, as you know, Chairman of the Council at the BMA for the moment. Professionally I am a senior member of the staff of the Medical School in Bristol, public health epidemiology and also a visiting consultant to the Bristol Royal Infirmary. I cannot pretend to doing a lot of active practice these days. The people who are doing the active practice every day are on my right: Dr Simon Jenkins, as a general practitioner who is also the Chairman of our Information Technology Committee and who has made a special study of the subject; and Dr Colin Smith who is a senior academic in Southampton, again a practising hospital clinician and indeed a Medical Director so he has experience on the administrative as well as the academic and practical side. Of course, on my left—no significance—Dr Ross Anderson who is Lecturer in computer and communications security in the University of Cambridge. I hope that is helpful.

407. Yes, thank you. Would you like to make any introductory remarks?

(*Dr Macara*) I would be very happy to take the opportunity. I just happen to have prepared a brief statement to make sure that I will not wander. I am very glad to have the opportunity to emphasise that it is an integral and very important part of the BMA's task—I think the Americans would tell us we ought to call it a mission these days—to promote the effective use of computers and computer networks in health care. Our anxiety is that doctors should become first better educated and then better informed in order to ensure that best practice becomes normal practice as quickly as possible. We demonstrated that in earnest by putting our resources where our principles are and the fact that we are currently investing over £1 million a year in the British Medical Association itself to improve library and information facilities for our members which will in turn, of course, improve their capacity and health care. A large and increasing amount of

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[2] BMA, Security in Clinical Information Systems, January 1996.

BMA activity is concerned with medical informatics and information systems generally. In addition we can claim to be leading the medical world in developing electronic information and library services as a benefit of membership. We are convinced that development of the information superhighway will play a crucial role in changing medical education and medical practice for the better. We represent, of course, every part, every strand, of our profession and we are anxious to do everything we can to ensure that the benefits of information technology are realised through effective education, research and development, that they are used by all doctors, not just the technical enthusiastic few but by all doctors to benefit our patients and that they are not discredited in the minds either of doctors or patients because of unnecessary and preventible breaches of our traditional ethics of confidentiality and our traditional and professional values.

408. Thank you very much. I wonder could you give us some indication of the ways in which you are laying out a £1 million a year to help your members?

(*Dr Macara*) Of course, we do have a number of activities which we are undertaking in the profession, and I think it would be more helpful to you if we expatiate on those because the £1 million that we are spending within the British Medical Association is primarily to make sure that we are networked, that we are linked up not just within BMA House nationally but in our 17 regional offices from which we provide services to members. Of course, there is a library, an information side, which we will speak about when we have the opportunity in detail perhaps a little later on. It might be helpful if Dr Jenkins and then Dr Smith can tell you something of what we are doing widely within the profession to encourage use.

(*Dr Jenkins*) Thank you. I think first of all perhaps I could say that from the general practitioner's point of view the actual take-up of computers by GPs in the United Kingdom is really a remarkable success story. Over 90 per cent of GPs now have computers in their surgeries and well over half of those actually have them and use them in the consulting rooms. It is probably the largest single group of clinicians anywhere in the world who have actually found a real and practical benefit for patient care in the daily use of computers and information technology in the context of the consulting room. The actual reasons why this has actually occurred over the last 15 years have been many but the driving force behind these reasons has been the perceived benefits for patient care, for individual patients, by their general practitioners. The computerised patient record, of course, brings many benefits. It enables the GP to identify which patients would benefit from follow-up. It helps with prescribing. It helps you to monitor the prescribing of individuals on complex prescribing regimes. It also helps to increase the rate of generic prescribing and thereby reduce the actual cost of prescribing. In fact, if one looks at the implementation of the immunisation and cervical smear programmes of the Department of Health, these have been carried out by GPs and it has been really because they have had computer systems in their practices that they have been able to get such very high uptakes. One of the actual impediments to progress at the moment is the need to legitimise the computerised medical record because at the moment it is part of the terms of service of GPs that they must make records on paper. If that can be removed from the terms of service, and we hope that shortly it will be, then GPs will be able to concentrate and improve the computerised medical record. Once that computerised medical record is improved they can then start looking towards using their computers more for communication. It is quite remarkable with an enormous take up of computers by GPs the actual need to communicate outside the practices has not really taken off. I believe that the main reason for that is primarily because that is being administratively rather than clinically driven. The success in general practice of computing has been because it has had a clinical basis for its activity.

409. Thank you.

(*Dr Smith*) My Lord Chairman, if I could just expand on that in two directions. Firstly you asked a question about what is the BMA doing? If I as a user could say one of the prime functions that the BMA has provided me with is access to library information and it is in the development of that area that I think the BMA is a key proponent of the use of network systems. Further, it is the repository for clinical audit nationally and it is the use of similar systems that is part of the key to the development of the hospital and general practice services. Within the hospital system we are perhaps a little bit behind general practice but there are many changes taking place, probably led through the academic world but hospitals are showing the way forward I think in using network systems for both education and patient care. If I could give you two examples. The first is that already there is both nationally and internationally availability on the network of educational programmes which are at a relatively simple level at the present time but are rapidly being developed. My colleagues in Southampton are developing such educational programmes. But there is a much more exciting development and that is telemedicine. That is the care of patients at a distance by consultation in the presence of the general practitioner with a consultant at a distant site, as is happening at Arrowe Park, or—more challenging—of doing surgery or highly skilled investigation at a distance. One example of that is the academic department at Manchester Royal Infirmary is already in a position to train surgeons using virtual reality at a distance, with feel. Similarly there are other examples of distance investigation. The Japanese have developed a system already where down the network I—as a gastroenterologist—could investigate somebody's bowel using a joystick on my computer desk. That is but one simple example of patient care at a distance. The downside at the moment is that part of medicine which is—how can I put it—the personal bit. Whilst you do get with video telematics the conversation, the dialogue, you do not have that personal contact or feel and that is the downside. Nonetheless there are dramatic changes taking place which we wish to encourage in the use of distance medicine and distance learning. Perhaps we might return to that at a later stage.

(*Dr Macara*) I think Ross Anderson may want to add a perception from the non medical side.

(*Dr Anderson*) Well, there are actually a number of separate things happening when we talk about the information highway in medicine, at least as I have been looking at it as an adviser on privacy and safety aspects. We have at least three things going on here. Firstly, you have the library aspects of service provision, where one is providing through the World Wide Web or through Medline access to information. Now that is something about which your Lordships have probably heard at great length from others so I will not go into it any further. The second aspect of it is the administrative aspect, how does one go about shifting around contract data, for example, between purchasers and providers. The third aspect is the clinical aspect, how do you manage communications between one doctor and another, an example being communications between a GP and a consultant using telemedicine. A simpler example is how do you go about sending an electronic referral letter from a general practice to a hospital and getting a discharge letter back. It is these very, very simple aspects of the information superhighway such as electronic mail between general practice and hospitals which probably have the greatest potential for bringing real short term gains. I have no doubt that in the medium to long term there will be a lot of gains to be had from telemedicine but right now working secure E-mail systems will probably bring the most benefit.

Lord Craig of Radley

410. You painted a picture of practices with their computers working within the practice very successfully and a big take up there. You have talked, or at least Dr Smith has, about the future, about the way some of these things may develop. Looking more to the immediate future, what pressures should there be to get best practice from networking between a series of practices. Where should that pressure come from? Is that something you see as entirely BMA driven or NHS? I would like to get a feel from you as to how you see development in that between practices where the patient is probably most interested in seeing things happening.

(*Dr Macara*) I am glad Lord Craig asked that question, my Lord Chairman, genuinely glad because we do feel that we are doing, from the point of view of the BMA, as much as a professional organisation can be reasonably expected to do to lead and encourage doctors and giving them incentives by way of making information available, helping to encourage them to learn how to use it. Obviously there have to be other carrots, if you like, because people have to be persuaded that it is better than what went before. The disadvantage Colin Smith spoke about, the perceived risk of being a less human process, that this is overcome, I would have thought Simon Jenkins might be able to address that.

(*Dr Jenkins*) I think certainly it is one of assessing perceived benefits on the one hand from this improved communication and on the other creating a critical mass of people out there that you can communicate with. I think the benefits must be judged against current methods of communication so they have to be better than a phone or fax or letter. I think there are certain impediments to change, as I mentioned at the beginning, and one of these primarily is to make the electronic record legitimate. Once that is so, and the GP becomes more and more dependent upon it, so too then will his need to communicate directly from it and to use other sources of information to improve best practice based on that record. Perhaps I could give you an example of that. There is in fact a system for improving prescribing called Prodigy that is currently being sponsored by the Department of Health and that is being run from the Sowerby Unit in the Department of Primary Care in the University of Newcastle. This was a product that was originally taken from Holland, the title there was Prescriptor. The idea is to be able to give advice to GPs about certain medical problems that present and to put into the guidelines within the system evidence based detail of what is the most appropriate drug to prescribe in that particular circumstance. Quite clearly at the beginning it was not really acceptable to many GPs because of the many different circumstances but by an iterative process the system is improving and hopefully the results of this will be published in July, that is after the initial tests have been done. There are five major GP computer suppliers and there are 30 practices within each of these suppliers who have been involved in these trials. Once the software has got to the stage whereby it has been evaluated, and very critically evaluated, it will then be able to be rolled out to the other practices who happen to have those supplier systems. That is a way of distributing good practice and expertise using GP computer systems. It may be done, of course, remotely through the information superhighway providing the proper confidential constraints are in place but I am sure our Chairman will come back to you on that.

411. I think we are going to come back to confidentiality but are you satisfied that the correct standards to ensure inter-operability have been identified in this process which you have described or is there a danger of having established four or five working models and networks but they themselves will not be able to cross-fertilise?

(*Dr Jenkins*) I think the standards relate to the interface between the GP system and the network. As long as those interfaces will be able to manage the exchange of information then I do not see a problem, in fact I see quite a lot of benefit in having competing suppliers producing different solutions to the problems that the clinicians perceive.

(*Dr Macara*) I wonder whether Lord Craig would wish Dr Smith to add something from a hospital and medical school side if we are to look at the whole of practice.

412. Please.

(*Dr Smith*) It is an extension of what Simon Jenkins has just been saying. There are already good examples of best practice which are shared both electronically and by standard print. Part of your question is take up. There are two issues which arise out of that question. The first is how do you break somebody's traditional practice to change it? For most of us the element is a reward of some sort, of "well done" or some more tangible benefit of people saying: "I want to come and see you, I need your services because I know you are good". That is one element, the reward side. The second is that the perception of the uses is that what is being promulgated is correct, in other words it has been validated. One of the problems about best practice at the moment is that it falls into three categories: word

Lord Craig of Radley *contd.*]

of mouth or simple abstract publication, that it appears on some network out of audit or it comes out of publication. The latter has established standards for peer review and authenticity, that is some sort of stamp of approval is put on it whether it be truly making it acceptable or just saying we think this should be known in the general purview. The next one down is here is something where people have actually measured what they are doing and shown how it works but there is no validation of the techniques or the outcome but it is there for people to see. The third one is anecdotes which sound all right but you have no way of knowing whether they are exaggerated or not. If we are going to take best practice forward using the network there is an issue about validation and if we were to ask for one thing to come forward it would be that there is a clear arrangement made so that one can identify whether the evidence being presented is or is not validated. That would really enhance best practice.

Baroness Hogg

413. Dr Jenkins, you have very kindly given us some broad orders of magnitude on the spread of computer technology through the surgeries of Britain but the particular focus of this enquiry is on the use of superhighways, interactive systems. I wonder if, moving on from the groundwork for such an enquiry which is the spread of computer technology or the development of software that may be used just in surgery without any interactivity, you could give us a greater feel for the spread of the use of interactive systems or anything that can be described as the use of superhighways in medicine today? Is telemedicine a rare example or is it spreading very fast?

(*Dr Jenkins*) The contrast is between the enormous penetration into GPs consulting rooms where they perceive a real clinical benefit and the pretty minimal use by those same general practitioners of extra practice communications other than for administrative purposes. You mentioned telemedicine. There is an example of the use of a dermatological service to a remote dermatologist by a GP's surgery in Wales. I also had the pleasure of seeing a live demonstration of telemedicine at the end of the AIM Conference in Lisbon marking the beginning of the Fourth Framework for Health Telematics. This was where there was a general practitioner sitting in his surgery north of the Arctic Circle in Finland with the patient, having of course given permission that her larynx could be demonstrated, to the assembled audience of many hundreds in Lisbon. It was really quite remarkable how this GP on the instruction of the specialist ear, nose and throat consultant demonstrating in Lisbon was told "just move your laryngoscope a little to the left so I can see that lesion you are trying to demonstrate". That was really quite remarkable. This illustrates how you can actually save experts' time in preventing unnecessary travel, on the one hand, and on the other you can actually distribute the expertise of that expert. Once the GP has been told how to look at the larynx, perhaps unfamiliar anatomical territory for him, and he has only to look at a few larynxes, and he feels confident enough to no longer necessarily need to call upon the expert for things in which he has gained expertise. Of course, it can actually have a direct benefit for patient care because if, for example, the carcinoma of the larynx is demonstrated the patient can then be immediately transferred to the centre and have their treatment there. It has benefits all round.

414. Do you see these benefits as being so powerful as to be introduced rapidly throughout the health systems of Western Europe?

(*Dr Jenkins*) I certainly do. I think telemedicine has particular benefits in relation to certain sorts of conditions. Things you can diagnose by seeing rather than things you have to feel, therefore dermatology is a very good example. Looking in orifices that are not normally exposed so that endoscopy, laryngoscopy, and similar procedures, are further examples of telemedicine where I am sure it would bring great benefit. Of course the benefits are greater when the distances involved between the locality of the GP and the specialist are greater. This is more likely in, say, Scotland and Wales, and if the traffic is bad some parts of the South West of England. That is where it would produce immediate gain.

Chairman

415. Nevertheless this sort of development does not seem to be taking place very rapidly in the United Kingdom. You say doctors are very much using computers in their surgeries and in their surgeries they have small networks so a panel of GPs can share information, but they are not yet communicating greatly with the outside world. What sorts of inducements, encouragements, changes in the rules do you think might be introduced that would promote the further development of this external connection?

(*Dr Jenkins*) What you are asking for is to provide a clinical imperative for the GPs and then see if they would take it up. What they have not got at the moment is that clinical imperative. They have lots of administrative reasons why they are being encouraged to communicate but not a clinical one. If there was sufficient encouragement, funding, and training, this would be something that I think would really take off.

Lord Butterworth

416. I have found what you said fascinating about the changes occurring but assuming they are successful and assuming that it develops in the way you were hinting it would develop, does the medical profession see revolutionary changes in the design of hospitals as a consequence of all this?

(*Dr Macara*) That, I would have thought, is a question more for Colin Smith perhaps because he is very much involved in the business of redesigning hospital functions if not structures.

(*Dr Smith*) In part. I find it an extremely difficult question to answer because part of the problem is you redesign your hospital for information networks and for teaching and for the medicine but something else comes along to fill its place. Medicine moves

Lord Butterworth *contd.*]

along all the time. Some of the traditional habits will remain, such as surgery. You have got to do it somewhere. Even if you do it by some distant remote skill, it has got to be done somewhere that is safe and whoever is doing it is the right person to do it. In that sense hospitals will not disappear. The internal structure may change and certainly communication with general practice will radically change, just as in academic medicine. It has already changed beyond my belief when I started in academic medicine; we now communicate solely by computer. There will be that order of change in our communication with general practice, it will be instant communication. In that sense hospitals will change.

417. I ask because I understood that there were a number of architects and others in the States who were exploring the possibility of quite radical changes because of telemedicine.

(*Dr Smith*) Yes, but they will still have to provide the facilities for those activities, some that Simon mentioned. There is some time when somebody has to see the patient.

(*Dr Macara*) Revolutionary concept!

Lord Butterworth] That is a comfort.

Lord Haskel

418. In the introduction we heard how the information superhighway is, as you described it, Dr Macara, a change for the better. We have heard about telemedicine and prescribing and medical records. The impression that I was beginning to get is that the benefits are really for the efficiency of the doctors. I wonder if you could tell us a little bit about how it can help the patient?

(*Dr Macara*) That is a very good question because our anxiety is that it shall help the patient. Our basic philosophy in medicine is that our only function basically is to provide what the patient needs, not necessarily what the patient wants, that is quite different, what the patient needs. Therefore, we see no conflict of interest so long as the doctor or the other health professional is in a position—and this we will come to later I expect—to reassure the patient about their ability to protect the confidentiality of information given to them in confidence. There is that assurance required in the interest both of the patient and of all the health professionals involved. I should not really trespass on my clinical colleagues in relation to the main burden of the question.

(*Dr Jenkins*) I think there are two broad groups of opportunity presented by the information superhighway. We have spoken about the opportunities for communication between doctors and health care professionals and now we are looking at the patient. The fact is that patients will have access to the same sources of information through the superhighway that doctors do. Some people have said: "Well does that not pose a threat to the professionalism of the doctor?". I do not believe it does and the reason I do not believe it does is because patients have always come in to me with "new" information. At one time it used to be just a cutting from a newspaper, then it was the radio, and then it was the television. Something they had heard on the television was new information and now on occasions it is something they have accessed through the Internet. They present this to me as new information, as something it may well be that I was not previously aware of. This is normal practice for me and for many other general practitioners. What patients want is to understand what that information, which is new to both of us, actually means to them. It is the clinical judgments that help me, with them, to be able to put it into the appropriate perspective and also to be able to identify further sources of expertise to give them further reassurance. I do not see this ability of patients to access the same information that I can access as a threat, I see it as a new opportunity and one which will bring further interest and excitement to general practice particularly.

(*Dr Macara*) Of course on the epidemiological side one ought to add it is obvious to us but it ought to be on the record that we are committed to what it is becoming common to call evidence based medicine. The evidence should be available so far as it is possible to make it unequivocally clear to the patients equally as to the doctors and the others caring for them. By extension, of course, there is an immense potential in health promotion in self-learning materials which patients can use in their own interest. I do not know whether Colin wants to add anything?

(*Dr Smith*) A very brief addition, Simon has put it very well. The availability of information is a benefit to the profession if the people they are dealing with know what you are talking about. If they have background information already it facilitates the consultation enormously. The downside is that information available without structure or comment does not put it in perspective and it is like newsprint. People come rushing in because they interpret minimalist information in a maximum way. In other words, they associate themselves with the illness because it seems like a good idea at the time. One thing we will have to do with the information highway is to make sure that the information is adequately presented to share, not to obscure basically. One of the problems with medicine is if we perceive a threat we will try to obscure when in fact we are both saying do not obscure, make it wide open. That makes the consultation and management and helping the patient far easier.

(*Dr Macara*) I wonder if Ross sees it the same way?

(*Dr Anderson*) One of the things I have observed, my Lord Chairman, is that on the Internet there has been a proliferation of support groups. Some of these have acquired a certain notoriety: sexual abuse recovery for example but there are many others which are helping people who have been victims of car crashes or plane crashes or whatever and may have locked up inside themselves some trauma that they feel reticent to talk about. Now the Internet can put people in touch with sufferers from similar complaints who are effectively anonymous because they are living in New Zealand, Hong Kong, Virginia or wherever and people have an opportunity to talk out the problems they have which just was not available before.

(*Dr Macara*) In case you are thinking of moving on, I am just a little concerned, my Lord Chairman, that we do not overlook the value of Medline. I think

Lord Haskel *contd.*]

perhaps Colin might like to say something about that.

(*Dr Smith*) I was just going to use Medline, that is the access to libraries, as an example of how it changes practice for the benefit of patients. There was a study done recently in the United States on Medline when it was rolled out on its availability to all practitioners. For those who used Medline not only did it change their approach to their patients but it improved their decision making, to the extent that the good practitioners started using Medline before they made their decision, to reinforce their decision. So the use of Medline enhanced the benefit to patients. The network is but an extension of that type of activity.

Lord Craig of Radley

419. In both oral and written evidence we have come across the issue of the veracity or otherwise of the information available. It seems to me as much as any other field this is a very important issue in relation to medicine and perception of the patient. That then raises in one's mind how does one try to ensure that the information is reliable? Is there a need for some form of regulation in areas pertaining to medicine for example? Would you be in favour of such a regulation and if you were how do you think it could be achieved?

(*Dr Macara*) I will answer that directly, my Lord Chairman. I am all in favour of regulation in the last resort because I believe in education and in encouragement and proper incentives and rewards built into the system as the ideal approach. Certainly we could pursue the question of regulation if we have to. I would have hoped that if we get best practice and if best practice becomes the norm then there will be much less difficulty in pulling the laggards into line, as it were. It is not directly relevant to this enquiry but I would just observe that our own profession did persuade Parliament to legislate for performance review procedures which will enable us to ensure that doctors do take the advice they get about best patterns of practice in the future. It is very much a matter for those of us involved in education and training them to ensure that they do this.

420. Forgive me but I am interested here in the patient's perception of all the information available, how confident they can be that the information is of good quality. We talked earlier about going to see your GP and so on but not everybody will necessarily go along to consult their GP, it might be the right thing to do but they may not do it. I am concerned, and it happens in other areas of activity, that where there is a whole host of information, some of it highly dubious, how does the prospective patient sort it out? It is in that area that I am interested in your views about regulations.

(*Dr Macara*) The clinicians of course are, if you like, the safeguarders or the custodians of the information so perhaps they ought to tell you how they see the answer.

(*Dr Smith*) It is an extremely difficult problem to solve but there are some suggestions we would like to make. Traditionally the validity is established by publication in a reputable journal that is peer reviewed. That does not necessarily give it the total stamp of approval but it gives it some validity. One thing that has happened with the network is that information is being provided at a much earlier stage without that peer review. So there are two ways you can deal with it. The first is to accept that one has to devise and approve a system of peer review for enclosing the material within a particular sector of the network. That is one way of doing it. The other is one that Ross Anderson earlier mentioned, that the availability of validated material or peer reviewed material is tied in to what we now call "publishing" but down the network and that is you pay for it, so you know that you are buying time into a particular validated slot. Everything else is not validated but it might be a good idea so you do not want to lose it. I think Ross Anderson has an example from mathematics where they share everything and it is only at the late end that they then get into the peer review published stage.

(*Dr Anderson*) Yes, my Lord Chairman, in the world of mathematics and computer science the way we work is that people write preprints of papers and put them up in ftp sites so they can be fetched electronically by anybody who is interested. The papers then get presented at conferences, the ideas get kicked around and if there is a mistake maybe somebody will point it out from the floor and other people will start building on the pre-published work as it were. Then perhaps two or three years down the line once the researcher begins to lose interest in the subject he will gather together everything that he has accumulated and write a proper paper for an archival journal that might appear four years after he first had the idea. This is diametrically opposite from the means of operation in the world of medicine and biology where people typically sit on their papers as a tightly guarded trade secret until they have appeared in due process in *Nature, The Lancet* or wherever. The question arises which of these two models is better? I do not think anyone can give an answer to that. I do not think we are going to see a diminution in the variety of publication styles that there are out there. There will occasionally be conflict. For example, when one is publishing a paper about the security of medical information systems do you follow the model of the computer security professional or the model of the medical professional? This is something that I have come up against once or twice. We are going to have a number of different models of what constitutes a respectable process of giving credibility to academic research. At the same time, however, we must remember that there will be a vast amount of uncensored material out there. If you go to your web search engine and you simply say: "Tell me everything about psoriasis", for example, it would pull up probably 5,000 pages for you of which 4,500 would be in the USA and most would not have been professionally produced. The individual when he goes and cruises around the web in entertainment mode will find a lot of information that is of questionable veracity. What can we do about that? I think it would be beyond the power of any one nation state to do anything about that given the international nature of the web.

421. Something to learn to live with?

Lord Craig of Radley *contd.*]

(*Dr Anderson*) I think that is what we will have to do.

Lord Flowers

422. We are all having to deal with that problem, are we not, because more and more the press take it upon themselves to announce our results before we are ready? Admittedly not in everything that goes on but in anything that is potentially publicly exciting that is what tends to happen so the peer review and all that goes out of the window.

(*Dr Smith*) It does, but how many of us as scientists would really take notice of what is in the paper except as an idea? We actually wait for the verified—

423. But your patients will and the public in general.

(*Dr Smith*) But we deal with that now, my Lord.

(*Dr Macara*) I think we should be aware of the fact that the Chief Medical Officer has taken a great deal of trouble to set up a mechanism which ought to secure, if you like, the probity of urgent communications, as the Department calls them, until such time as they are in the hands of those who need to know in the interests of ensuring that patients can have the best advice and so on. That wretched example of the Pill scare, the third generation Pill scare last October, has done so much damage with unwanted abortions and so on. What happened was that one of the individuals initially receiving the information and bound to confidentiality had a wife in the media who could not resist taking advantage of a scoop. That, it seems, is something we also have to live with. May I just add one little point. I am trying to monitor as we go along the points that we are making. We have been discussing the problems about new work, if you like, coming on the record and getting into the Internet and so on before it has really been validated as fully as we would like. I would have thought that in terms of everyday practice as distinct from the new work, the review work is almost in a routine sense more important, in other words clinical audit. It is important to emphasise that there is now an unequivocal professional commitment to clinical audit right across the board, and indeed again the BMA is happy to be able to show that it is practising what it is preaching in literally accommodating the National Centre for Clinical Audit along with our friends the Royal College of Nursing, and with funding, I am glad to say, from our friends the Department of Health. We do begin to have mechanisms not just for getting information which assists best practice but for propagating it.

Lord Haskel] I was just going to make a comment, my Lord Chairman, while we are discussing this matter of patients having information. Of course, this is nothing new. I remember as a child we used to have a book at home, I think it was published by a soap manufacturer, and if one of the children were ill my parents would look through the book, identify the symptoms and the book would tell you what to do. This was a way in which we saved money by not going to the doctor.

Baroness Hogg

424. The BMA publishes books of this kind!

(*Dr Smith*) Peer reviewed.

Lord Flowers

425. Could we just have a word at not too great a length on security and confidentiality. It has come up in at least three forces already today: keeping records and transactions confidential; preventing falsification and corruption deliberately or otherwise; avoiding covert surveillance of medical practice, all these we have touched upon. You have been good enough to put on our tables today, or somebody did on your behalf, a report on *Security in Clinical Information Systems*. That will be very useful when we have had a chance to read it, I am sure, because I have glanced at it quickly. It makes the whole problem seem very complex, very difficult, very alarming and full of holes and therefore the question one is bound to ask to start with is, is it really necessary to have such an emphasis on confidentiality? I know it is the ethical background of the medical profession but we have to learn to change these things when they become impossible to operate. I just wonder whether information technology has not perhaps reached the point where some of our precious things are going to have to go. Quite apart from that I wonder whether Dr Anderson could summarise the essential points from this report since we have not read it but I do not want him to have the whole of the floor because I would like to see what medical doctors say about it too.

(*Dr Macara*) I am sure Ross will be happy to lead.

(*Dr Anderson*) Well, my Lord Chairman, when we are talking about the security of clinical information as opposed to the other things we mentioned earlier such as the security of administrative information, there are basically two concerns: privacy and safety. It may seem at first sight that the two are sometimes in conflict. For example, if you have a heart condition then you want this to be known to any ambulance team that may happen to rescue you after you collapse in the street. However when you start looking at things in detail the conflict is not that acute. In the case of people with conditions that ought to be known to carers, for example, such as heart conditions then the standard operational procedure is to carry an emergency medical card. This means that the relevant information can be made available to those who need it without it being generally broadcast in circumstances where it might be used against the patient, for example in credit reference enquiries. Now looking at the broader picture, what we find is that in medical systems, unlike say in the traditional banking or military systems where most security technology was developed, there is a requirement for security to be controlled by the user or for practical purposes by the user's advocate who would usually be the general practitioners. We do not have the environment where you have completely centralised control and centralised access to all information. The reason we cannot have this is if you create a large database with the information on everybody in the country in it, it might be convenient but then hundreds of thousands

Lord Flowers *contd.*]

of people would have to have access to this information and the risk of penetration and the risk of improper use and disclosure would be 100 per cent. What we have to do is to find robust and effective mechanisms for allowing users and clinicians acting on their behalf to restrict access to personal health information to those people whom they choose to have access. Now we have come up with a number of principles which can be implemented in computer systems and which will see to it that this happens. Currently we are doing a pilot among a number of general practices to make sure that the principles are practical, and we believe they are, and what we have basically got as a result is we believe a constructive way forward for removing the worries about confidentiality and enabling widespread use of telematics and other communications technology in the support of medicine.

(*Dr Macara*) That is a brief review, my Lord Chairman, the clinicians would no doubt like to communicate how they see it.

(*Dr Jenkins*) Firstly, my Lord Chairman, in answer to Lord Flowers, my concern about the importance of privacy is not really so much as a doctor but as a patient or as a citizen. Therefore I believe it is of fundamental importance to ensure that my rights as a citizen are protected. The real benefit of information technology is that you can actually now make it much more secure than in the manual systems. It is a theoretical possibility it will be translated into practical effect if one starts from the perspective of having a proper security policy that places the issue of confidentiality at the centre of its requirement or its specification. One needs to protect the privacy of the individual rather than the security of the organisation.

426. You must be paying a lot for your privacy in that case.

(*Dr Jenkins*) You feel, my Lord, that it is more expensive to protect privacy than not to? If one sets up a system of computers which are interlinked or have the opportunity to link them up, then you can spend an awful amount of money in setting up the infrastructure but if patients realise that their confidences are likely to be threatened then they will not wish the professionals who look after them to use them. The loss of public confidence in a network that is not secure will be an absolute disaster because all of the benefits we have been talking about now will not come to fruition. It is fundamental that privacy is at the centre of our concerns.

Baroness Hogg] There can be very little privacy in telemedicine. Your example of the entire conference in Lisbon peering down the larynx of somebody in Finland does not mean their privacy was a prime object.

Lord Flowers

427. With permission.

(*Dr Jenkins*) Exactly. There are two aspects, there is the question of consent and of course one actually wishes to obtain proper, informed, explicit consent. We, the BMA, believe—and I am sure our Chairman will reiterate what I am going to say perhaps more eloquently—that of central importance is the need to obtain proper consent from patients so that they really understand what information is being held, where it is going to, who has access to it and so on. Providing that consent can be obtained then there are times when it would appear that privacy is breached. Privacy is not breached if consent is obtained. If it is not obtained then there needs to be legislation to ensure that reasons for disclosing patient's information without consent are based in law and there are proper penalties for those who breach it. Of course the Lord Walton Bill[1] is one which has taken that issue in hand. The other aspect, of course, is in relation not to the consent issue but to security. I think this was the question that was asked and therefore where patients have not given consent for their information to be revealed it needs to be held securely and in such a way that confidences are not breached.

Baroness Hogg

428. There is always a grey area here, is there not? If you were a patient in a remote area and you were told you could have this advanced form of endoscopy down the telephone line or whatever but at the price you lose control as to who knows somewhere out there in the ether what is done to you and what your condition is, it is not exactly an unrestrained choice as to whether to protect your privacy or not.

(*Dr Jenkins*) I think it all hinges on how you inform patients and how you obtain consent from patients. For example, let us take the issue that is causing us concern and this is the question of item of service claims by general practitioners. Formally when a patient went to a GP for contraceptive services they signed a form registering for those contraceptive services and it was understood that that form went off to the FHSA where the details about their contraceptive history were held, namely the fact they were receiving contraceptive advice. I am quite sure that many people did not realise that those databases with that information were not under clinical control. However, you could argue they had given consent because they had signed the claim form. Now with the item of service links, the patient does not have to give that authorisation and the information goes down the wire to the FHSA or the health authority from the GP. I cannot understand why the name and the address of the patient with their contraceptive history has to go to the FHSA for me, as a GP, to be paid for that service when I can do a minor operation on another patient such as remove a wart and all I have to do is to declare the number of procedures that I have carried out. It makes no sense when you are forced to breach the confidentiality without consent of the patient for contraception but you can do a minor surgical procedure without having to identify who that patient is.

429. I do not want to labour this point but it seems to me you are making my point for me. Saying: "This patient consented because in the constrained circumstances of a GP surgery they put their

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[1] The Disclosure and Use of Personal Health Information Bill [H.L.], which received its second reading in the House of Lords on 13 March 1996.

Baroness Hogg *contd.*]

signature on the piece of paper that they probably did not read" is no real guarantee that they have consented to the consequences that they may not understand of that signature.

(*Dr Jenkins*) I certainly agree with you but that is no reason why we cannot improve it.

430. It has to come from the profession.

(*Dr Jenkins*) In our security policy document which you have, the policy is not only for computerised information systems, it is for manual systems as well. We certainly need to improve the way in which we actually handle the issue of consent and confidentiality, all of us.

Chairman

431. I am afraid that time is running out, Dr Macara and colleagues. Could I ask you, if you would care to do so, to write and let us know in a little more detail just why it is that you stress so much the importance of confidentiality and in what respects you wish to stress it? Secondly, how do you intend to take forward these concerns in the light of the Government's announced intention in the Second Reading debate not to support Lord Walton's Bill? I do not want you to answer now, could you write and tell us?

(*Dr Macara*) We will be very happy to do that. I am sorry that time ran out because we would be equally happy to do it now.

Chairman] Because he has not had a chance to ask anything I will ask Lord Hollick if he would like to ask the last question?

Lord Hollick] I wanted to ask rather a general question which went back to Lord Butterworth's question about what is the future for hospitals in this new world. Can you just give us a very quick overview of the future of the economics of the National Health Service and how it will be impacted by all of these dramatic changes that seem to afford the opportunity for considerable concentration of resources and more efficient use of resources?

Chairman

432. May I interject before you begin. A three or four sentence answer is all that we have time for and a written reply will suffice.

(*Dr Smith*) I was trying to put together just a sound bite. There are two elements which will constrain the economic climate of the hospitals in the future. The first is that medicine in its widest sense is continuing to expand. We are not stopping doing what was done a century ago, we have just expanded what we can do and each horizon is more difficult. The influence of telematics or superhighways or whatever will not dramatically alter. In fact it may accelerate that advance. In those economic terms the health service will be more demanding. The opposite side of that is that the superhighway hopefully will change practice by using best practice and changing the economics that way so it will be a balancing act. I have to say that I think demand will exceed the retrenchment but within it the communications side will dramatically change with people not pushing all this about at vast expense, with people being able to communicate much quicker, people being able to do things outside the hospital, even outside general practice, from the home, that will actually in that way modify the economics.

(*Dr Macara*) Could I just add, if I may, that in short I would hope that the developments we envisage will enable us to make our health service needs led rather than, as they are at the moment, demand led and that that should be if not more efficient at least more equitable and more fair.

Chairman] Thank you very much, Dr Macara and colleagues, that was very helpful.

Supplementary evidence by the British Medical Association

INFORMATION SUPERHIGHWAY

At our oral evidence session on 16 April, the BMA was asked to submit more detail on the following points:

- why the BMA places such importance on the confidentiality of personal health information;
- how the BMA intends to take forward these concerns in the light of the Government's lack of support for Lord Walton's bill; and
- how the changes in information technology will impact on the economics of the NHS.

These points are addressed below:

WHY COMPUTER SYSTEMS MUST RETAIN CONFIDENTIALITY

Confidentiality is central to the doctor-patient relationship which should be a partnership of mutual trust. Patients are in an extremely vulnerable state when faced by health professionals including doctors. They are not aware, for example, what features of their physical, mental or social status are and which are not relevant to the diagnosis, treatment and management of their condition. Patients must therefore be prepared to share honestly information with their doctor if their doctor is to do their best by the patient. In order to encourage this, patients must be assured that sensitive information passed on to their doctors will not normally be divulged to another without permission.

It is essential that *all* patient information is treated as sensitive and handled with the same level of security. Individuals, and not the health professions, should decide which information may be shared and with whom. What type of information is considered to be sensitive will depend partly on the individual concerned, and partly on circumstances. Whilst it is likely to be generally recognised that information concerning a positive HIV test, or a termination of pregnancy, is sensitive, there may be less general understanding currently about the sensitivity of details of, for example, stress-related illnesses and in the future the results of predictive genetic testing. Such information may be detrimental to the prospects of those individuals for employment, insurance, etc.

Thus, patients must be able to trust that doctors will not pass on identifiable personal information without their permission, and similarly that information cannot be accessed by others, not directly involved in their care without consent. The implications of patients withholding information from those providing healthcare from them are great. Clearly doctors need full information about their patients for diagnosis and to provide appropriate care and treatment. There are wider implications than this; a patient concealing a condition such as epilepsy which could make driving dangerous, puts the public as well as himself at risk, but also others. In addition, full clinical information is essential for the public health purposes of epidemiological and outcomes studies, to advance scientific knowledge and understanding.

BMA ACTIVITY ABOUT ITS CONCERNS ON CONFIDENTIALITY OF IDENTIFIABLE PERSONAL HEALTH INFORMATION CONTINUES DESPITE THE GOVERNMENT'S LACK OF SUPPORT FOR LORD WALTON'S BILL.

The BMA Council:

- advised its members as a matter of policy not to link their systems to the NHS-wide (or any other) Network until a competent data security policy is implemented to protect patient privacy.
- commissioned a data security policy *Security in Clinical Information Systems* from Dr Ross Anderson of Cambridge University Computer Laboratory, October 1995.
- distributed the policy, for constructive critique, to Chief Executives of NHS Trusts and Directly Managed Units (DMUs), Medical Staff Committees of Trusts and DMUs, Regional Health Authorities (RHAs), Directors of Public Health of RHAs, Executive Directors of District Health Authorities (DHAs) and Family Health Service Authorities (FHSAs), Chairmen and Secretaries of Local Medical Committees, Chief Executives and Executive Directors of Special Health Authorities, Chairman of Public Health Laboratory Service (PHLS) Board, Medical Royal Colleges, Patient and Healthcare Professional Organisations, Audit Commission, Data Protection Registrar and Ombudsman, January 1996.
- agreed to the submission by Dr Anderson of a scientific paper based on *Security in Clinical Information Systems* to the Institute of Electrical and Electronics Engineers Incorporated (IEEE) Symposium on Security and Privacy on Oakland, California, 6-8 May 1996.
- is jointly sponsoring, with The Isaac Newton Institute, an international scientific meeting *Personal Information—Security, Engineering and Ethics* which will be held at Cambridge University, 21/22 June 1996.
- undertook a programme of briefings for healthcare professional and patient organisations from July 1995.
- held series of meetings with Secretary of State, ministers and civil servants between BMA elected members and secretariat.
- raised awareness with BMA members, healthcare professionals and patient organisations with confidentiality up-date briefing papers since July 1995.
- fulfilled a programme of speaking engagements on confidentiality of health data by BMA elected members and secretariat at conferences of healthcare professionals, Information Technology (IT) specialists and BMA Divisional meetings.
- maintains a watching brief of developments on IT and handling of identifiable patient data in NHS.
- developed a handbook on *Disclosure in the Public Interest* (to be published May 1996) to define the narrow range of situations where identifiable health information must be shared—even without patient consent (eg cases of murder, rape or at the direction of a judge).
- commissioned a critique of NHS Executive's Information Management and Technology (IM&T) Strategy and its implications which will be published in June 1996 and widely circulated.
- undertakes detailed briefings to journalists, thus raising of public awareness of issues on privacy of personal health data in newspapers, journals, television and radio.
- is now making a detailed study to respond to the Department of Health—Home Office consultation document *The EC Data Protection Directive (95/46/EC)* June—July 1996.

- will be working constructively with Lord Walton and through him with Government to ensure that British legislation is evolved in line with the proposed European legislation outlined in the Data Protection Directive, and in good time to comply with any timetable for such implementation.

FUTURE ECONOMICS OF THE NHS

At this stage, the economic impact of information technology on the NHS is not quantifiable as the long term impact cannot be clearly foreseen.

There are implementation costs in specifying, commissioning and installing IT systems, the employment of IT staff, and the training of healthcare professionals. Transaction and communication costs will be a sizeable budget item for the NHS.

However, the use of IT in the clinical consultation increasingly affects the way doctors practise, teach and audit medicine. Use of IT will have a positive impact on the collection of data for audit and medical research, and will provide information about current morbidity, treatment patterns and outcomes. The instant availability of decision support systems will help doctors to adopt evidence-based best practice.

We estimate there may be modest financial gains by improving the passage of information between clinicians, and from video conferencing, allowing patients to access distant hospital specialists while still with their own GP in his/her surgery.

Easy direct access to information has the potential for both doctors and patients of increasing their awareness of existing and developing treatments. This may well increase the demand for treatments.

In the NHS, currently 1.6 per cent of resource is spent on information technology. This contrasts starkly with banks, for example, where computing and communications are the largest non-interest cost.

The BMA does not recommend any further centralisation of NHS IT expenditure in the hands of the NHS Executive. Historically the most successful computing initiatives, such as computing in general practice, have been driven by clinicians and supported by management.

A. W. Macara

2 May 1996

Further supplementary evidence by the British Medical Association

We discussed, briefly, Mr Roger's comments about the legitimisation of GPs' medical records. The attached leading article in this week's BMJ *The paperless general practice* may be of interest (*not printed*). I contacted our General Medical Services Committee (which represents all GPs working in the NHS) who tell me thay *have* been consulted by the Department of Health on this. There is no Parliamentary action involved as it would be an amendment to GPs' terms and conditions of service rather than an amendment to primary legislation or Regulations.

Negotiations have taken some time, but Mr Rogers appeared to indicate that the issue could be resolved in the next few months.

Please let me know if you need additional information on this or other issues.

Sue Marks
Head, Parliamentary Unit

3 May 1996

Memorandum by the Department of Health

INTRODUCTION

The call for evidence lists eight questions which range across the topic of information superhighways, which the Sub-Committee has defined as publicly accessible networks.

This memorandum provides background on information superhighway activity in the NHS. It also addresses the following questions: 2(vi), 5(v), 5(vii) and 7 in the context of activity underway or planned by the Department of Health.

A STRATEGY FOR INFORMATION MANAGEMENT AND TECHNOLOGY FOR THE NHS

Information Management and Technology (IM&T) is a term which covers the use and management of information and information systems. This applies to organised systems of all forms, whether based on human endeavour, paper methods or information technology.

The emerging electronic world offers enormous benefits to organisations of all types. If the NHS is to gain the most from information management and information technology for the maximum benefit of patients, the NHS as a whole must approach IM&T systematically.

The NHS Executive's Strategy for IM&T in the NHS was launched in December 1992 and aims to develop consistent information systems across the service, provide more efficient communication and processing of information and support high quality, effective and responsive healthcare. The framework at the core of the IM&T strategy—the infrastructure—sets agreed national standards and codes. It covers NHS-wide electronic networks, a new NHS number and important aspects of security and confidentiality. The work and progress to date has focused on implementing the IM&T infrastructure and promulgating the necessary standards. Much of the infrastructure will be in place during 1996.

A NHS-wide networking infrastructure—called NHSnet—is currently being implemented to enable any to any connections for all organisations in the NHS, including hospitals, GPs, the NHS Executive, health authorities and so on. However, NHSnet has not been designed to be publicly accessible and will, in general, only be available to NHS users.

IMPLEMENTING NHS-WIDE NETWORKING SERVICES

Framework contracts have been signed with BT and Mercury to provide a wide range of voice telephony and data services. A key feature of the framework contracts is that as demand for networking facilities increases, the necessary resources ie bandwith, can be "called down". This will provide a networking infrastructure to take the NHS into the 21st century.

NHSnet is based on Private Finance Initiative (PFI) principles with BT and Mercury providing all the capital investment and sharing the risk in establishing the service.

NHS-WIDE NETWORKING SERVICES AND THE INTERNET

The Internet is a global collection of thousands of individual computer networks, governed by no-one and strung together by the international telephone system. Originally created as a defence application by the US Government, it was opened to universities, government departments and research organisations in the late 1970s. In 1992 private companies were allowed to offer subscriptions, and anyone with a personal computer, modem and connection through a service provider can access it.

In essence the Internet provides a world-wide network infrastructure supporting electronic mail and access to a wide range of information systems and services. However, lack of security, guaranteed services levels and structured mechanisms to allow users to find information services makes the Internet unsuitable for business-critical transactions. For the NHS this would mean, for example, the exchange of personal patient records.

In comparison, NHS net is exclusive to the NHS, with guaranteed service levels and appropriate security measures and procedures built-in. However, secure gateways to and from the Internet are available to allow:

- Two-way interchange of electronic mail between NHS and Internet user communities.
- NHS access to Internet-based systems and services, whilst preventing access by Internet users to NHS information systems.

2. *What services are being provided, and should be developed/will be required, within for example the following areas—(vi) health?*

The business case for NHS-wide networking, approved by the Treasury, is based on the high volume "bread and butter" information flows across the NHS, such as Voice/PSTN; electronic mail; exchange of contract information; supplies ordering; and links from GPs to Hospitals and Family Health Service Authorities.

However, the networking infrastructure—NHSnet—which is currently being created for NHS use will also support more publicly exciting applications provided by Internet type facilities. This potential is creating considerable interest amongst application suppliers. The NHS Executive has received a significant number of proposals from academia and industry offering to provide the NHS with a range of services. Approaches have been made involving consortia of major companies and organisations such as Glaxo, ICL, Zeneca, the BBC, NAHAT, and BT. There is scope for PFI projects to take these forward.

Potential applications available across the network include:

Telemedicine: at its simplest, telemedicine can be real time video links set up to enable a GP and his or her patient to consult with a consultant in another location. More complex applications involve "telepresence", for example key hole surgery performed at a distance, with the aid of a real time video link, by an extremely specialised surgeon. Telemedicine raises major clinical and organisational issues that will need to be explored but it is already apparent that there is potential for revolutionising the way in which the NHS works, including the skill mix of the professional staff involved. An overview of some current high profile examples is given in Annex A.

Education: access to knowledge bases, video banks and decision support systems can facilitate continuing clinical education. Clinicians will be able to see operations performed in real time at locations remote from them (not only in the UK), or be able to call up training videos on demand.

Knowledge Bases: healthcare professionals will be able to access the latest information from a vast range of material. Knowledge bases of pharmaceutical products and information on outcome measures are just two examples of what could be made available.

Bulletin Boards and News Services: these will enable NHS staff to communicate more effectively with each other and provide feedback, views and order services.

Ministers have agreed that the quality of information or service on the network is the responsibility of the relevant profession where it deems it necessary.

A "NHSnet Reference Group" has been established with the following terms of reference:

To advise the NHS Executive's Information Management Group on the:

- Scope, nature and content of strategic partnerships with NHS-wide networking suppliers, particularly BT and Mercury.
- Handling of issues arising in the context of NHS-wide networking in relation to the provision of knowledge bases, information services and applications over the NHS-wide Networking services.

The Group has decided that some basic rules have to be determined for organisations offering to provide a Service on the Network. These will certainly cover the following areas:

- The criteria of the Security Code of Connection must be satisfied.
- Service Suppliers must agree and pay to have their security procedures audited. Applications, which must be for NHS purposes only, will be scrutinised by members of the Group to ensure that any proposal is in line with current policy.
- A central communications management group established by the NHS Executive to oversee networking services in the NHS will be the final arbiter as to the services/applications installed on NHSnet.
- A level playing field should be maintained among providers of services.

CURRENT INITIATIVES

Discussions are taking place with BT to provide, through a private finance initiative, the means to allow NHS users to browse and navigate through the proposed superhighway services using Internet type tools but on the secure NHS-wide Networking system.

The recent completion of the *GP Efficiency Scrutiny* ("patients not paper") emphasised the need to reduce significantly the administrative burden on GPs to allow them to concentrate on face to face patient care. This study unequivocally supports using information technology. It is planned to harness the superhighway capabilities that will be available for exclusive NHS use to achieve the objectives of this initiative.

A similar exercise is underway examining health authorities working methods and it is anticipated that networking services will be at the core of its recommendations.

6. *What is the role of central Government in connection with the "Information Superhighway" service provision, including the following areas:*

(v) access to Government information?

Department of Health Use of the Information Superhighway

Department of Health officials are using the Internet to retrieve information and to communicate with the research, medical and scientific community. A Departmental Internet mailbox is under consideration. Once a link to the NHSnet is established it is expected that Department of Health officials will use this network extensively to communicate with the National Health Service and to retrieve information.

Department of Health World Wide Web Site

The Department has maintained an Internet World Wide Web Site on the CCTA's Open Government WWW server since 20 June 1995, and is amongst the most heavily used of the Departmental home pages. The Internet site address for the Department of Health is: http://www.open.gov.uk/doh/dhhome.htm.

The site includes details of its strategic aims and objectives, National Health Service developments, Research and Development activities, Departmental publications and events, the NHS Code of Openness and progress on the Health of the Nation Initiative. In addition Departmental Press releases are available as are links to Departmental agencies. These Internet home pages are revised as new information becomes available or existing pages are updated. A "What's New" page is available to help alert users to new amendments to the Department's home pages. A feedback form facility is available, and details of Departmental publications and their availability, as well as the full text of some Departmental publications and information packs, can be downloaded. Details of a number of the Department's information phone lines are also listed.

Further information is being added to the Department of Health Internet site, including material on the Organisation Codes. An interactive Medlink service has also been mounted, whereby developers of new medical devices can contact the Department's agent acting for the Department of Health's Research and Development Directorate. Overall usage of the service has increased by approximately 200 per cent over the six months the service has been running, and the site is now referred to in both the IT press and in training course on electronic healthcare information.

(vii) data protection, confidentiality and censorship?

The introduction of data networking services allowing the ready exchange of information between NHS organisations brings with it the risk of unauthorised access to information, in particular personal patient records, in whole or in part, and also accidental or deliberate corruption of information. Addressing these risks has been and will continue to be seen as a very high priority, and consultation with the professional representative bodies on issues of security and confidentiality has and continues to take place.

Elegibility for access to the NHS-wide Networking data services is carefully controlled, and signing a Code of Connection, outlining the terms and conditions of connection and use of the networking services, is a mandatory requirement. A security audit of the connecting organisation may be necessary, to ensure that the overall security of the network is not compromised by some inherent insecurity of a connecting organisation.

The British Medical Association have indicated that information, particularly identifiable patient data, should be encrypted before it is sent across NHS-wide networking services. A study into the need for implementation and use of encryption across the NHS-wide Network reported in December 1995. Ministers and the NHS Executive are considering the implications of cost and practicality in encrypting data transmitted across NHS-wide networking services.

7. *What will be the impact of the "Information Superhighway" on working practices and employment prospects?*

Initially the network is expected to be used for high volume administrative flows, such as contract related transactions, GP Items of Service Claims, distribution of prescribing statistics. GP/Hospital information exchange is recognised as a high priority, for referrals, discharges and test requests and results for pathology and radiology. Electronic mail for *ad-hoc* correspondence across the NHS and between the NHS and the NHS Executive and Department of Health is expected to become heavily used.

However, electronic networks can facilitate entirely new ways of working with a potential fundamental and substantial impact on the NHS. Telemedicine, particularly in its most sophisticated forms, could revolutionise many aspects of the delivery of, and access to health care and fundamentally impact on skill mix requirements.

January 1996

Annex A

TELEMEDICINE—A FEW CURRENT HIGH-PROFILE EXAMPLES

Institute of Telemedicine and Telecare, Queens University, Belfast, run by Professor Richard Wootton, who earlier in the year moved from the Royal Postgraduate Medical School for Medical Physics, Hammersmith Hospitals Trust, where he ran a similar department. Professor Wootton is an internationally-acknowledged expert on telemedicine/care issues and has several live projects that cover the major aspects of this field:

- Remote diagnosis—for example the Royal Victoria Hospital trauma clinic in Belfast, which has much experience gained from treating bomb victims and gunshot wounds, is able to share that expertise with a community walk-in clinic in London.

- Real-time remote second opinion by specialists at Queen Charlotte's Hospital, London, on foetal ultrasound images from the Isle of Wight.
- Distance learning, including real-time links between hospital operating theatres and Medical School lecture theatres.

PLATO Project—about enabling access to pictures of poisonous plants/fungi on which the Poisons Unit can offer remote advice. This system has been featured on several TV programmes.

SuperJANET—a very high speed electronic network for education and research, is being used for testing and piloting:

- distance learning/training services.
- remote access to an award-winning multi-media based system for cervical cytology training, known as Cytovision.
- electronic journals such as Nature.

Powys FHSA runs a Tele-Dermatology Project, whereby pictures of skin conditions are transmitted from the GP's surgery to the consultant Dermatologist, and a real-time two-way video-conferencing link allows the GP and Consultant to discuss and agree the diagnosis and treatment.

Leeds General Infirmary has established a system to allow remote monitoring of surgery procedures for medical students.

Wellcare Telemedicare Network in Massachusetts General Hospital provides a "tele-consultancy" offering diagnoses and advice on patient treatment and management for a fee basis. This service is currently offered primarily to Saudi Arabia.

BT are involved with projects in Australia whereby patients with chronic conditions are remotely monitored in their own home via telecommunications links, to pre-empt the onset of acute symptoms that would otherwise require emergency treatment. There is the prospect of similar pilots taking place in the UK (with PFI implications as BT would provide the backing with their own resources).

Tromso, Norway is the focus of important work on the use of telemedicine for the delivery of healthcare to remote parts of northern Norway where physical isolation and severe climatic conditions would otherwise make normal healthcare delivery impossible.

January 1996

Examination of Witnesses

MR RAY T ROGERS, Executive Director, Information Management Group, and MR ANTHONY J KING, Head of Networking, Information Management Group, Department of Health, called in and examined.

Chairman

433. Mr Rogers, Mr King, you have heard what the BMA had to tell us. I wonder whether you would like to introduce yourselves and make some preliminary statement?

(*Mr Rogers*) My name is Ray Rogers, I head up the Information Management Group of the NHS Executive and as such I am responsible for the creation of strategy, the implementation of strategy, in the NHS for all aspects of information technology and information. Tony King is the Director within my Group who is responsible for aspects of telecommunications and in that respect, of course, is responsible for the NHS wide networking system. What I would like to do, if it would be useful to your Lordships, is first of all to indicate what we believe are the advantages of having an NHS wide system of networking of the type we are creating and then to inform your Lordships of just how far we have currently got. First, I should say that you cannot, I believe, realise the sorts of benefits you have just heard of, nor the benefits that I would like to outline, unless you have a clear infrastructure within the NHS. That is much more than having a system of NHS wide networking, it does mean having a clear statement about the standards which you expect computers to comply with if they are to intercommunicate, standards for technical matters, data definitions, codes for clinical terms and administrative data, message standards and have the unique identification of people through a new NHS number etc., etc. I have no intention of talking about that part of the infrastructure but all I have to say is underpinned by a lot of activity of that nature and I would be happy to talk about it if you wish me to. As to the advantages of having a modern NHS wide system of networking in the NHS, I think it comes under a number of headings. The first and most important one, of course, is direct care of the individual. I can only give one or two examples under each heading to indicate what I mean by that. For example, for the GP to get the result from a hospital as soon as it has been produced in the hospital from pathology or radiology, for example, this is what we are about at the present time. It is clearly advantageous to have an on-line booking of an outpatient's appointment, that is something I think the NHS needs to have. If you can book a holiday anywhere in the world then it is about time that you can book an outpatient's appointment before you leave the GP's surgery. Also, for example, to have GPs able to access their own computer systems when they have a portable computer in a patient's home is another example of direct advantage to the patients. There are enormous advantages to efficiency and I

Chairman *contd.*]

divide these into two. One is E-mail which is the straightforward sending of text by computer and structured information which is equivalent to sending forms, if you like, electronically. Certainly we believe we could save at least £100 million a year by doing these things electronically in the NHS and that buys an awful lot of hip replacements. For forms and claims, where we can get maximum power, is when we can structure data. If you structure the information in the message you know where the information is, you can use that information for other purposes, you can use part of it in the database for research, you can use part of it for contracting, you can use part of it to automate processes like payments. Having messages structured and doing what is called true electronic data interchange, that is having things happen at both ends rather than just sending a text electronically, is where the power of computing of this sort really comes. We believe there are about one billion messages of this sort that could be sent in this structured way and we are already sending millions of them that way. In training, all training is being revolutionised by information technology and it will be so also in the NHS in due course. For example, in maintenance for skills, to have access to video banks or CD roms which tell you about procedures which you may have perhaps forgotten how to do or to more sophisticated things; where you want to learn better how to do something well. All this will maintain skills in the NHS: there will be new training methods.

Lord Flowers

434. You have talked as if CD roms and videos are part of the information superhighway.

(*Mr Rogers*) Access to video banks certainly is becoming and will become part of a superhighway.

435. It is the access bit you are talking about?

(*Mr Rogers*) Yes. I am talking about getting access to banks of videos or banks of CD roms through a network by downloading in real time which one is already seeing in some parts of the country through British Telecom and cable companies. We know already that it is possible certainly, and one can easily see a demonstration, to be able to view an operation remotely from Surrey where I live being conducted in Newcastle real time, voice over the top, to ask the surgeon questions as it is happening. Then there is access to knowledge and to decision support systems and to care protocols through the network. Access to libraries, access to outcome databases, and we have a very good one in this country called the Cochrane Centre, and others. These are ideas that people are already bringing to us, for example to have a large databank containing images with commentaries of experts on them for the purposes of training and increasing knowledge. A networking system I think can really begin to realise evidence based medicine. We are now launching within our networking system what we call an NHS web or an intranet (which is now the word for an Internet service using worldwide web technology) which runs within an organisation as distinct from the global Internet. We are introducing such a service now in co-ordination with British Telecom. That will support also a bulletin board facility for those who wish to communicate in this means. Also we will have access through to the global Internet but the access from our network into that global Internet will be through a secure gateway to protect people from access from without but which allows you to go from inside to outside. There will be undoubtedly new ways of getting access to care and it will have a substantial impact on the skills' need within the NHS through telemedicine. I do not know when it will come about but certainly it will come about. There is a number of examples now in the United Kingdom where telemedicine has been practised and what is clear is that we will need in due course to think about the skill mix we have in the NHS and what we need in the future. It will have an impact on the way we distribute our care facilities. At the present time, certainly it could bring direct benefits to patient care at two ends of the spectrum, the end where you can remotely look at images, and in Queen Charlotte's Hospital in London they run a service with the Isle of Wight for ultrasonic scans, for example. Or at a very much lower end where a GP practice at an outstation premises manned by a practice nurse can have a link which can carry images or carry a TV image. Then you have a different type of relationship now with the practice nurse than you had before. Also for the public there are new ways of getting information to the public. Interactive television is now arriving, it is arriving in the entertainment world but also it is being experimented on by British Telecom in places like Ipswich where you can get new services to people and they can interact with the computer. They call it a TV but the distinction between the TV and the computer is disappearing. You can interact with that computer in order to access information. The other day I was speaking to people in Liverpool who have an excellent CD rom about birth and they are thinking about how they can make that available to patients who attend their hospital, for example, but doing so on the network. Finally, and paradoxically I think, one of the driving forces of having an NHS wide system of networking is you can control security. What we are putting in place is a network which contains the best of security measures. I will be very pleased to describe them. They are better, they are improved and it is a vast step forward in the networks the NHS is using at present. The NHS is using hundreds of different networks at present all of them incompatible, many of them poor and many of them insecure. The networking system we are putting in place will replace those networks in due course. That is an exciting picture but I would like to go back to ground level. Our emphasis at the moment is on the basic applications of messaging, of getting access to knowledge bases through the NHS web and getting to the point of electronic communications, for example between GPs and hospitals for clinical messages, and for people doing more efficiently things like item of service claims. For that purpose I think probably about 25 per cent of dentists are already making their claims electronically to the DPB. 66 per cent at this point in time of computerised general practices are doing patient registrations electronically and most of those are now moving on to make their item of service claims electronically. In terms of the networking system

Lord Flowers *contd.*]

where are we? We have some large strategic partners with whom we have negotiated contracts and signed off services. So our core network for access to all our national applications including the NHS web and access to Internet is an IP network, that is an interactive protocol network. This allows you to do interactive things on the network and that is quite important. That is being supplied by British Telecom in a private finance initiative contract. They are putting in all the capital and taking all the risk. We have negotiated service level agreements and tariffs far better than anybody else is getting because we have them in competition with another supplier, Mercury, and a third supplier, Racal, all of whom want this business. Our networking system will comprise interlocking networks from a few different suppliers. They will be fully interconnected but it will ensure that we have fierce competition on service level and on tariffs. Already there are a number of connections to British Telecom's core network, the prescription pricing authority is connected, the supplies authority is connected, there are a number of areas of the country connected and we would expect by the end of this financial year to see all hospitals and all health authorities connected to the network for at least one application. We have a link to an existing networking or message handling service run by Racal. The link is only for messaging and it is not interactive, and therefore is only for messages but Racal are connected already to virtually all computerised GP practices and that is 90 per cent of the 10,000 GP practices. They have 12,000 different connections to the network for messaging purposes. One of our other network suppliers, Mercury, with whom we also have a framework contract is connecting up East Anglia, for example have taken that contract and are connecting up to Mercury and Mercury and BT are already interconnected. We have safe gateways already in place for access to the Internet. For messaging we have another Private Finance Initiative contract with the company BT Syntegra, their services are in place. They have put up all the funds and taken all the risks in exchange for the business and for that business we have got tariffs at 70 per cent lower than the tariffs the NHS was paying at one time because they are in competition with Racal who provide our second message handling service. I could provide sets of documents that we have issued on security and confidentiality and we have been extremely active in the last few months. We share all the concerns the BMA have. We believe we are doing an enormous amount. In fact, I believe that the NHS has never been so subject to so much guidance on security and confidentiality measures. I would be very happy to describe them but I sense I had better stop there.

Lord Craig of Radley

436. Your earlier comments were talking about the value of structured information and in fact I think, to use your words, having things happen at each end. In our earlier evidence this morning we heard from the BMA about the importance of making electronic records legitimate. I would be interested in your observations about the legitimacy of these records and interactions which you have described?

(*Mr Rogers*) In terms of GP records there is a constraint at the moment that GPs are bound to keep their records on paper. I expect very, very soon that that will be legally changed. All the steps are in place and I believe it will no longer be a problem within weeks or months. In that sense the electronic patient record will be legitimised but only in the sense, of course, that GPs can hold their records electronically. There are other legal issues that arise in keeping records electronically in terms of audit trails, lack of signatures and the like. Although we are ensuring that as we legitimise the electronic patient records in the GP practices we at the same time insist that the GP's suppliers of systems put in audits which we believe will be sufficient to allow people to keep electronic patient records. In the end legitimacy can only be judged in courts but we believe we are putting in place all that is necessary to ensure that people can conduct their business in that way.

437. Can you remind me what is the basis of that legitimacy you are talking about? Presumably there is an Act?

(*Mr Rogers*) There is a need to change the GP's terms and conditions which are—

438. That is by regulation, is it?

(*Mr Rogers*) I really could not tell you. It is a minor change. I would be very pleased to let you know.

Chairman] Perhaps you could let us know the answer to that.

Baroness Hogg

439. You gave us an admirable and fascinating survey of development of networking throughout the NHS, so thank you very much. It is with some shame that I ask this question. Having listened to evidence earlier from the BMA I do not think the word "NHSnet" ever appeared and having been given a picture there of developments of computer technology within surgeries but with a very limited interactive connectivity beyond the surgery, can I ask this very basic question. One, what is the NHSnet? Two, how much of the National Health Service, how much of general practice at this moment, is connected to it and how fast do you expect that to change?

(*Mr Rogers*) NHSnet is a word for the NHS wide networking system and it can only be a real system when everybody is connected to it.

440. So it does not exist at the moment?

(*Mr Rogers*) It exists in the sense that anybody can connect to it now.

Lord Flowers

441. Who do you mean by anybody?

(*Mr Rogers*) Anybody in the NHS can connect to it.

442. Me?

(*Mr Rogers*) No. Any NHS body can connect to it simply by ringing up BT or Mercury and in the messaging sense, Racal, sign a contract and connect.

Lord Flowers *contd.*]

443. Private consultants?

(*Mr Rogers*) It depends on the context in which they are working. Not private hospitals. That having been said, we have published quite clear guidance as to the rules which we will apply if we allow other people's networks to connect to the NHS network. For security reasons it is reasonably easy to protect your network and allow electronic messages to flow from one network into the NHS network and therefore BUPA's network for messaging purposes, subject to a number of the rules we have to apply, could be connected to the NHSnet. At the present time it is for NHS bodies only. As to the number of people presently connected, there are about 200 or so connections made at this point to the NHSnet in the IP sense. By that I mean if you include the Racal messaging service, to which we are interconnected, that multiplies things vastly to about 12,000 connections but that is for messaging only. By the end of this financial year we expect all 500 acute providers, that means all the acute hospitals, and I am talking about trusts here, and all health authorities, which as you will appreciate is now a combination of a district health authority and a family health service authority, to be connected to the network for at least one application. Most of those applications at this point in time will be for messaging. There are enormous gains to be had in messaging but that does not mean that the network cannot be, and will not be, used in some cases for all the other applications. But I would not wish to mislead you. My belief is these other more exciting applications will take time to develop and indeed the Executive Board itself has decided to look at training, telemedicine and new services strategically over the period of this year to take a long-term strategic view. In my terms they are on the medium term, they will start now—all the things I have mentioned are happening somewhere—but I do not think we will see large take-up of some of the more exciting sounding things at least until the end of a three to five year period.

444. What about the more basic ones? The one that interested me very much indeed was when I go into my GP they can actually book me an outpatient's appointment with similar facilities as if I go into a travel agent they can book me a holiday. What sort of time frame are we talking about there?

(*Mr Rogers*) I believe that will depend on the culture in the NHS. What we will provide is the infrastructure. There are places already where that happens but very few. The major barrier really in many places is the willingness of hospitals to allow it to happen. I do not make that as a critical comment, I just make it as a comment. Providing there is willingness for it to happen then it is now enabled. I would not like to say that it is so easy that you just go off and buy it off the shelf because that would be misleading but many people have modern systems in hospitals and for those who have and are prepared to invest in an interface with the GP surgery then these things can become and are enabled.

Chairman

445. Given the potential benefit you seem to be taking a rather gloomy view of the rate of uptake of this splendid system. What are the principal barriers as you see them to that? Are they mainly cultural?

(*Mr Rogers*) I do not think there are barriers to messaging. The major barrier in the clinical messaging is the question of security and confidentiality but generally I do not think there are barriers with the network now being in place and the standards which we have laid down. The real realisation of electronic data interchange, that is making things happen at both ends, means you have got to think very carefully of what is actually supposed to happen at both ends and have software at both ends to do those things. Those sorts of applications will increase slowly as people learn how to automate their processes over a period of time. In the sense of things such as telemedicine I think a great deal of work has yet to be done to establish how to get real benefits out of telemedicine. It is not to be assumed, I think, that the benefits are simply there because you switch them on. There are a number of issues I think to be faced there. I am quite convinced that in due course the real benefits of telemedicine and where they really lie, will be established. But before you can do it, of course, you have to have the infrastructure and we have only just about got an infrastructure. When I say we have an infrastructure our contracts with British Telecom and Mercury allow us to pull down any band width that we require so all the applications I have outlined have become enabled providing you decide to connect up. As I say, there are some happening now and there are many people now thinking about the ways in which they can market their services over a wider scale by using telemedicine. One of the barriers to date has been the technology to allow you to do it but again that is being enabled now gradually.

Chairman] You are obviously an enthusiast Mr Rogers, if you could wave a wand what wand would you wave to increase the rate at which these developments take place?

Baroness Hogg

446. Over whom?

(*Mr Rogers*) The wand I would wave, my Lord Chairman, is the investment in the necessary interfaces between the networking and GP practices. We know exactly what we require in a practice to enable all these things to happen and because there are so many GP practices that is where the major costs lie. So if I could wave a wand I would invest about £5,000 in every GP practice in the land and connect them to the NHS wide networking system. That interface would enable them to take advantage of all these things I have mentioned providing they wish to do it and they have partners with whom they can do it. The investment at the hospital end is larger but in terms of the turnover of a hospital it is very, very small beer.

Lord Flowers

447. You were talking about security, you have mentioned it several times.

(*Mr Rogers*) Yes.

448. I want to ask about cost. The doctors are insisting that a secure system is essential, that patients want it, so they say, although I do not care who sees my medical records and I suspect that goes for an awful lot of patients but never mind, that is not your problem. You joyfully go about trying to provide them with the security they want, of course you do because it is fun, great fun but there is a cost. I would like to know the order of magnitude of the additional cost of providing security of the kind the doctors want presents you with? The question must come sooner or later for the cost of providing security how much medicine could you provide? I think it is important to get some idea of what this cost is.

(*Mr Rogers*) Yes and I would share that view. Certainly we are determined to protect the confidentiality of health data but we are determined also to balance the risks against costs. You can never be 100 per cent secure, that is a truism. The question therefore is how close to 100 per cent do you endeavour to get. In the NHS wide networking system the provisions which we have put in place which people can use at their choice to protect their databases from access from unauthorised users do come generally with modern networking systems anyway and you would expect them to be there. I will ask Tony in a minute to tell us what it costs for somebody who wishes to protect a sensitive database from direct access. We have an arrangement whereby if they wish to protect it in a manner which forces anybody who is trying to access it to have one of these personal authentication devices which are available. I will ask Tony King to tell you how much having one of those might cost. In a sense the big risk is people getting into the databases where the data resides as distinct from intercepting it as you send the message between one computer and another. The much lower risk is that interception and that interception can be protected in a number of ways and there are all sorts of security measures you can put in place but one way is to encrypt the message. We have just commissioned a report on this because we realised there was relatively low risk but the possibility of quite a high cost and administrative and technical complexity. The report has just been published, in fact last week, and its finding is that the cost will be £20 million.

449. Forgive me Mr Rogers, you are illustrating my point very well that it is fun.

(*Mr Rogers*) No, I do not think it is fun.

450. I am quite convinced it is fun from what you have said, what I really want to know is how much it all costs? The cost of providing the security?

(*Mr Rogers*) The encryption is £20 million over three years to put it in, two to three million pounds per year thereafter. What ministers have undertaken to do is to pilot encryption to test out the conclusions of this report.

451. Do you need larger machines to deal with the encryption software?

(*Mr Rogers*) That may be the case.

452. How much more do they cost?

(*Mr Rogers*) This is included in the £20 million but it does not follow that you need more powerful machines, you may do. That is the purpose of piloting it. It rather depends whether you try and encrypt the whole of large files or whether you just try and encrypt little bits of them. There are a number of issues, namely the speed of the software or the hardware at the interface, which may determine whether you need a bigger machine at the back end. The £20 million over two to three years is the estimate we have for that aspect of protecting security.

Chairman

453. Mr King, you are going to tell us what the cost of access is?

(*Mr King*) Yes, the individual device costs about £60 so if you multiply that by 10,000 GPs you get some order of magnitude. I suspect the cost will come down quite considerably but it is not a great cost. I think the cost that has to be understood is the on-going administrative cost of keeping track of such devices. What happens if a GP loses the device, do we deny him access to the database simply because he has not got it with him and it may be a mission critical operation at that time. There is always a hidden overhead to providing security systems and the case for whether we use them or not is not for me to decide fortunately. There is an upfront cost of approximately £60 probably reducing to £50 maybe even £40 maybe even free eventually but there will be a significant administration cost both people, resources and perhaps denying access to information in the event that this becomes lost or misplaced.

Lord Hollick

454. You talked earlier about the cultural barriers to realising many of the great benefits that you have outlined that technology can deliver. How do you overcome those barriers? We have heard earlier from the BMA how the medical profession is tackling them. I think for many people going into the National Health Service is an administrative nightmare. In the area of administration technology, particularly network technology, is ideally placed to deal with those problems yet little progress seems to have been made.

(*Mr Rogers*) I think I would challenge that little progress has been made. I have lots of invitations to travel around the world and talk about what we are doing in the NHS so I think I would challenge the rosy picture that is sometimes painted of what is happening in other parts of the world. That having been said, compared with other sectors the NHS is not up with the leaders by any means. What do you do about the cultural issues? We do what we can to demonstrate to people the advantages of IT in particular ways but there is nothing like having it for real. My experience is that as soon as you demonstrate you are getting benefits and people are getting benefits from these things then others start to follow. In order to follow you do have to have the infrastructure to do so. It is only recently, since we have been implementing our strategy over the last two years, that the NHS is beginning to have, and virtually now has, that infrastructure to move

Lord Hollick *contd.*]

forward. Can I give an example in terms of electronic mail and the need for senior management to lead from the top. It is in the area of senior management that the NHS has inadequate awareness and skills. I say that because it is well known. In the Department of Health when we introduced an office information system, and everything in the Department of Health is done on electronic mail internally, as soon as the chief executive and the Executive Board started to use it they became irritated when they had to send paper to some people who were not on it. It so happened that I was one of the last, because of the building I was sitting in, and my director was highly irritated by the fact that I was not on it. Very quickly if you were not on it you did not exist because people would not put things into envelopes and send them to you. If we can persuade, and we do a great deal to try and persuade, senior management in the NHS to recognise the advantages simply at that sort of level, because it very often starts at that level, then we will begin to succeed. I am sure that awareness is increasing markedly in the NHS but I would not like to claim that it is as well and as good as I would like it to be because it is not.

Lord Haskel

455. We heard from the BMA about benefits of the infrastructure and we have heard from you about how you are providing an infrastructure, we have also heard about how BT through PFI is providing the funds and providing the means of logging on to the NHSnet. You have told us that £5,000 is all that is required for a surgery to log on to the system. One gets the impression that everybody seems to be waiting for everybody else. I am wondering what is being done, in view of the fact that everybody agrees that the patient at the end of the day benefits, to promote the system and get everybody on to it and to just move the whole thing forward?

(*Mr Rogers*) A great deal. I think we will be making rapid progress. I do have to emphasise these contracts were only put in place in the middle of last year so the amount of progress we have already made I think is significant. There are several things. For example, the Cabinet Office efficiency scrutiny called *Patients Not Paper* had 25 recommendations relating to information management technology. I am charged with implementing those recommendations. If you strip them aside what they say is improve computerisation in GP practices and make their communications with the outside world electronic. We are now mounting what we call trailblazers to demonstrate how you can do that. We already have the message standards and message content agreed with the clinical professions, apart from the infrastructure that I mentioned. We know how to do it. We have now put it in place to demonstrate the advantages you get from doing it. The Executive is quite determined to push these recommendations through. I have now a deal—I hope—with British Telecom and the Supplies Authority to see all acute hospitals connected up by the end of the year at least for the purposes of all the supplies ordering. That will ensure that all the supplies staff are linked to their central organisation. That link can also be used, for example, for sending contracting data. We already have, again another PFI initiative, a clearing service that came into operation I think yesterday with the first exchanges of data. So during the course of this year all of that contracting data will be cleared by this clearing service and by the end of this year something like 30 million messages will be passing through that clearing service. That means that all health authorities and all acute providers, and I believe some other providers as well, will be in the business of structured messaging by the end of this financial year. That, I think, is quite a considerable degree of progress given the amount of time we have actually had these contracts in place. The people we are dealing with—Mercury, BT, BT Syntegra, AT&T Istel, who are running the clearing service -are very large telecommunications giants. They see the NHS as an enormous driver and they are very keen indeed to support all we are doing. I think that is exhibited by the amount of cash they have already injected into creating the infrastructure and their willingness to do deals with us to make sure everybody connects to it. I am optimistic about the GP end. I know already of one health authority which is very keen now to connect up all their GPs in the way that I said, and that is 88 GP practices, and all their hospitals and themselves, all for E-mail and all of these things. I suspect they will do so during the course of this year and I do not think they will be the only ones.

Chairman] Any casual browser on the Internet knows there is a great deal of medical information so that is a thing that concerns us.

Lord Hollick

456. I think one of the concerns we would have is of the quality of the information. We were talking to the BMA earlier about their concerns in this area. Does the NHS have any plans to put up their own site which will have verified reliable information which the public will be able to know and trust which is not to say the public will not be able to venture—as many of us do—into these other parts but at least they would know it was a reliable NHS site which had verified information on.

(*Mr Rogers*) We have no current plans to put one up for the public. What we are launching now is, as mentioned, our NHS intranet called NHSweb which will enable NHS bodies to get at information of various kinds which could include medical material, would include access to libraries and could include access to almost anything you could think of including, for example, catalogues from suppliers since we allow people outside to put information on to allow people inside the NHS to get access to it. Within that provision anybody who puts up such a database—which could be a database of training material for doctors which could be extremely sensitive if the training material was not of good quality, and the position that we have struck here in agreement with representatives of the medical profession and ministers is that we will have a field in what you call the home pages, that can be completed or left blank. If it is completed it will say "certified by" whoever and therefore anybody claiming to have certified material can make the claim. If it is blank

Lord Hollick *contd.*]

then you know you are in a position you would be in if you walked into Dillons tomorrow and took a book off the shelf, if it was on your syllabus you knew it was okay, if it was not then you make your own judgment. That having been said, it will be up to the professions to run an accreditation scheme if they wish to do so but what we have facilitated is at least the field where that could be recognised.

457. You do not see the NHS having particular responsibility for putting out verified information?

(*Mr Rogers*) I think it would be very difficult if not impossible for the NHS, by which I take you to mean the NHS Executive, to exercise that function.

Baroness Hogg

458. What about the Health Education Council, would they have that role?

(*Mr Rogers*) They could have the role of certifying material if they chose to exercise it.

459. Or putting out their own.

(*Mr Rogers*) If they put out their own they could make it clear that it came from the Health Education Authority and therefore it would carry, obviously, the weight you apply to that authority. If the medical profession wished to accredit training material, for example, then they would be the body in the best position to do that if it was the necessary thing to do. What is clear to me is that the Department of Health Executive are not in a position to credit material in that way. They have neither the resources nor do I believe they have the proper skills to do it.

Chairman

460. As usual we are running out of time. Would you like to make any closing statement, Mr Roger or Mr King?

(*Mr Rogers*) Only to say I think we have a very exciting future ahead.

461. You have made that clear.

(*Mr Rogers*) On the other hand I think it would be wrong for me to leave anybody with the impression that the most exciting things on the agenda will happen quickly. They do not happen quickly in the NHS, they have never happened quickly anywhere else in the world but I am quite sure they will come about with the infrastructure we are putting in place.

462. Mr King?

(*Mr King*) Just to say that the NHS wide networking system is predominantly based upon data but we do have an input to ambulance private mobile radio communications which will facilitate the exchange of data. We are also making very significant cost savings on the voice telephony side. Already we can prove a £4 million a year saving year on year and we predict that we will be increasing that to £10 million probably by the end of the financial year so it is a very significant programme.

Chairman] Thank you very much. If there are any other matters that you think might help us in that rather complicated and wide ranging study then we would be glad if you could let us have information about them. Thank you.

Lord Butterworth] It might be worthwhile if we could see the documents on confidentiality.

Chairman] That would be helpful. Thank you.

Supplementary evidence by the Department of Health

LETTER No. 1

During the course of the evidence session on Tuesday, 16th April, the Department promised to provide the Committee with the following documents:

NHS-wide networking—Security project—Security guide for IM&T specialists

EL(95)108—Security in the NHS-Wide Networking System

Data Networking Security Policy

Code of Connection for NHS/non-NHS organisations

HSG(96)15—NHS Information Management and Technology Security Manual.

The NHS IM&T Security Manual—NHS Executive

HSG(96)18—The Protection and Use of Patient Information

The Protection and Use of Patient Information—Guidance from the Department of Health

The Use of Encryption and Related Services with the NHSnet—A report for the NHS Executive by Zergo Limited

These are attached (*not printed*). I hope this is helpful.

Ieuan Jones
Parliamentary Branch

18 April 1996

LETTER NO. 2

During the course of the evidence session on Tuesday, 16th April, the sub committee asked for information on the means by which the Electronic Patient Record would be legitimised.

At present GPs are legally obliged to hold records on paper. Legitimisation would be achieved through a Statutory Instrument amending the NHS General Medical Services Regulations 1992 paragraph 36 of Schedule 2.

I hope this is helpful.

Ieuan Jones
Parliamentary Branch

19 April 1996

TUESDAY 23 APRIL 1996

Present:

Butterworth, L.	Haskel, L.
Craig of Radley, L.	Hogg, B.
Flowers, L.	Phillips of Ellesmere, L. (Chairman)
Gregson, L.	

Memorandum by the BBC

1. Introduction—The Information Society and Britain's Digital Future

Over the next 20 years, digital technology will revolutionise the audio-visual services available to the home, school and workplace. It will deliver to audiences a range of new services—radio with CD quality sound; multi-channel television; pay-per-view; interactive services such as home learning and home shopping and some form of video-on-demand. It will transform the way programmes are made, and the way in which they are distributed through each of the main delivery systems—cable, satellite, telecoms and terrestrial.

Digital technology offers the opportunity to receive substantially more channels and services on any given distribution system and it increases the volume and quality of information that can be stored on tape or disc in the home (see figure 1). All digital information (whether it be pictures, sound, or text) can be sent down the same distribution system, providing a common method of delivering a range of services that currently form distinct industries (print-based media, broadcasting, computing and telecoms, for example).

The digital revolution will not just bring technical convergence, it will bring about a convergence of a number of industry sectors too. The audio-visual sector is currently dwarfed by the scale of the telecom and retail sectors but once industry sectors come together, the potential exists for a market worth £50 billion (see figure 2).

Britain has significant advantages in the digital age. It has a liberalised telecommunications regime, ahead of other countries in the vitality and pace of its development. It has the English language, rapidly becoming the *lingua franca* of the Information Society. It has the strongest audiovisual sector in Europe, representing £6 billion of the EU's overall audiovisual spending of £27 billion.

In the BBC, it has Europe's largest programme maker outside the US and Japan and Europe's largest exporter of TV programmes and related products. This audiovisual leadership, coupled with the commitment to learning the new skills of the multimedia age, offers Britain a real opportunity to become a major supplier of digital content for all the formats and distribution systems available in the digital age.

2. The BBC in the Information Society

The BBC will seek to be a major player on the information superhighway, providing high quality programmes and services and encouraging audiences both to sample a wider range of material on core services and to take up new services.

The BBC has four main roles:

- ensuring that high quality UK content is dominant on public service networks available to all
- acting as a trusted guide on the superhighways
- sustaining a strong UK production base and range of skills for the expanding audio visual sector
- encouraging industry-wide technical standards and helping to drive new media take-up.

The BBC's new Charter confirms the BBC's public service role, but also empowers it to develop new commercial services, including interactive multimedia services, and to distribute these on a variety of systems. The BBC has already begun to pursue these aims.

It has extended its licence fee proposition—for instance by the launch of Radio 5 Live and by its pioneering role in digital audio broadcasting. The BBC believes it should take full advantage of digital flexibility to extend still further the value to the licence fee payer. In particular it is exploring the potential for a 24-hour news service to offer audiences fuller access to the breadth of material gathered for the BBC's regional, national and international services.

The BBC has, with partners, launched and developed new commercial services for overseas audiences (BBC World and BBC Prime) and for UK audiences through its participation in UK Gold.

The BBC's long-term aspiration will be to provide programme services that are available on all forms of digital television and on digital audio broadcasting. Last year the Government granted the BBC a whole digital terrestrial multiplex on the understanding that our existing public service channels would be simulcast in full. Given its commitment to digital broadcasting, the BBC will wish to be part of the launch phase of DTT, taking up these guaranteed frequency slots to broadcast its core licence-fee funded services in widescreen along an enhanced Ceefax service and programme guide. The BBC has been granted its own multiplex by the Government, a development which we welcome as offering the Corporation real scope for leading Britain into the digital age.

The BBC believes it should take full advantage of digital flexibility to extend the value to the licence fee payer from its existing investments. As well as a 24-hour news channel, the BBC could exploit digital technology to offer uninterrupted coverage of sporting events, of Parliament, artistic festivals such as the Proms and a whole host of major national and international occasions. In a digital world, for example, the main VJ Day ceremonies could have been offered in high quality widescreen, with a changing mix of parallel coverage of the various events in London and the regions. On a full multiplex, the BBC could offer today's schedules as usual but with the additional opportunity to catch up with the best viewing at convenient times, offering audiences further access to outstanding programmes, to educational output or to full coverage of a major event shown live earlier in the day. The BBC spends £950 million a year on two strong television networks. Digital technology provides the opportunity to offer licence fee payers fuller value from that investment.

The BBC is already committed to ownership and transmission of the full national digital radio multiplex on which it is offering a pilot service. The Government has granted the BBC a full multiplex because it recognises that the BBC alone has the strength of commitment to local, national and regional radio.

The BBC, in its turn, has made it clear that it will seek to stimulate the market by launching digital audio services even before reception equipment is available in the marketplace. As such, it will play a catalyst role in encouraging manufacturers to produce digital reception equipment, other broadcasters to transmit digital services, and listeners to purchase digital equipment and listen to the services. Digital audio broadcasting will provide the opportunity for the BBC to convey its existing network services, and extended coverage within those services—particularly sport and parliamentary coverage—at the push of a button.

The BBC is also investing in multimedia activities. It has established a Multimedia Centre, to train staff and to develop the necessary production skills, and to manage the BBC's public service Internet pages, which are already some of the most popular on the net. Commercial multimedia development is managed by the multimedia division of BBC Worldwide Publishing.

The BBC believes that education will be one of the first areas to benefit from the new multimedia forms of delivery. The technology will be available in schools at an early stage, and interactivity has been shown to be a key feature of educational effectiveness. In addition, programmes can be made available on demand and it will be possible to provide significantly enhanced support services which can be downloaded as and when required by learners.

The BBC is developing its CD-ROM activities with education firmly in mind. Two Shakespeare CD-ROMS have been published and there are a number of other commercial CD-ROM projects in the pipeline for schools including French, more Shakespeare, and two CD-ROMs for geography.

BBC Education is developing a service for teachers on the Internet to link broadcast output for schools to further textual information as well as to other useful sites on the Internet. A new web-site is being developed to support The Learning Zone, the night-time educational service. The BBC's overall presence on the Internet spans the range of BBC services and comprises over 7,000 pages—from *Blue Peter, Top Gear* and *Tomorrow's World* to *The Archers* and *Woman's Hour*. Coverage of the 1995 Budget, complete with background information and analysis, was made available through the Internet. Research is in progress to develop a commercial BBC on-line service.

The BBC is participating in various video-on-demand trials by providing content, and designing user navigational guides for BBC programmes which are part of the trials. In the UK, these include the British Telecom trial in Ipswich and Colchester and the Cambridge Cable trial in partnership with On-line media. We are also involved in trials in the US and Hong Kong.

3. Making the most of the Information Society: Open Access and Fair Competition

The information society offers the prospect of a greater diffusion of information and learning, encouraging people to acquire the skills they need to act as informed citizens and take part in the national debate. This will not happen if an "information rich/information poor" society develops, in which only those who can afford the technology or subscription payments can benefit and in which public service broadcasting channels, for example, cease to be available to all.

The early multi-channel experience for audiences in the UK has been conditioned by the way in which the satellite and cable industry has developed, in analogue, as essentially a closed environment. This closed environment, only now coming within the reach of current regulatory control, has allowed one or two dominant players to control which services are made available to viewers and at what cost. This is achieved through control of the so-called "gateway"—the point at which viewers are able to access services and service providers are able to charge for them. If abused, the effect of the gateway could be to limit the range of available services, to deter new market entrants and to reduce the level of competition on quality, service and price (see figure 3).

The importance of the gateway will be boosted in the digital world by the fact that most of the new channels will be paid for directly by the audiences receiving them—in the form of subscription or eventually "pay-per-view". Already subscription fees account for 20 per cent of all industry funding; they are expected to increase threefold or even more. Many of the services funded by direct payment will prosper on a relatively small reach of the whole population—indeed their success will often depend on targeting the segment of the market which values the service the most and charging appropriately. Universality is unlikely to be a key objective.

In contrast, public service channels have a remit to ensure that a range of high-quality programmes and services are available to everyone. The BBC will wish to continue to serve the whole audience and not just those sections which are commercially attractive. The BBC is committed to an authoritative service of news and political coverage as well as a wide range of factual output in peaktime, including history, science, wildlife, consumer and social action programming. As now, in the digital age we will strive to offer something for everyone, wherever they live and whatever their tastes.

Viewers too will expect to be able to continue to receive the public service channels for which they have paid. They will expect this as a right.

However this right could be under threat. At present, all homes receive network television free-to-air terrestrial delivery systems and then some choose to supplement those services with cable or satellite packages. But in the future, and especially as digital terrestrial transmission replaces analogue, households will choose a single delivery system for all services. We expect, well within the life of the new Charter, anything from a half to two-thirds of households to choose cable or satellite delivery (see figure 4). Those cable or satellite systems may well be owned by broadcasters who compete with public service channels. These owners could not be blamed if they favoured their subscription channels over free public services.

These operators could enjoy a monopoly of distribution into the home. Viewers therefore need a guarantee that public service channels will be available on these systems as well as over conventional television aerials, many of which will fall into disuse as has already happened in Germany.

In the multi-channel universe, it is equally important that viewers can find public service channels on the electronic menus that will be provided to guide them through the many hundreds of services available. These electronic programme guides (EPGs) will be more than a screen-based Radio Times. They will be able to learn their owner's programme preferences and guide them to new programmes they will enjoy. But there is a risk that the provider of an EPG could abuse that position to guide viewers either towards their own or towards the most profitable programmes.

To protect viewers' interests in these areas therefore, the BBC proposes that satellite services "must offer" their viewers access to public service channels; that cable companies "must carry" public service channels without having to pay copyright clearance; and that public service channels are made "easy to find" on electronic programme guides.

4. CONCLUSION

The UK has the most successful public service broadcasting system in the world, but in order to ensure a well-balanced broadcast economy in the digital age Britain needs to continue to sustain and develop a broad-based television industry, involving strong networks, as well as an increasing range of niche and specialist services.

Deregulation has been a powerful force driving the globalisation of telecoms. But deregulation has to be backed by strong anti-monopoly powers to prevent market distortion. The successful transition to digital will depend on whether the various transmission systems can offer services of real value to the audience; and that, in turn, will depend on the participation of a range of programme providers and their ability to recoup the costs of a high-quality and competitive range of services.

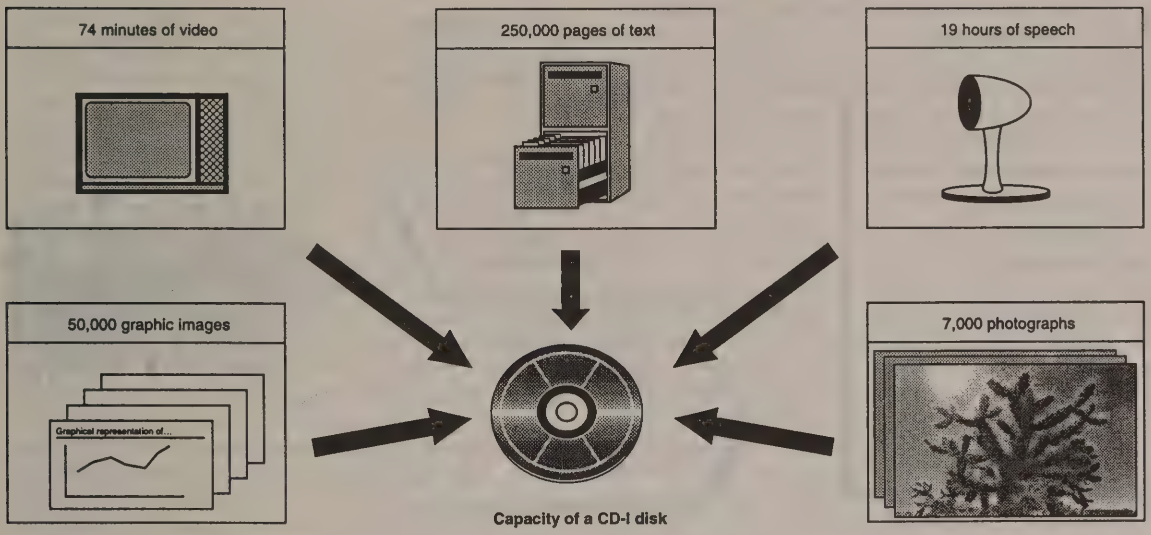
The challenge for government is to create a framework which both encourages enterprise and innovation in a fast-moving field and preserves the benefits of a plural society. And as increasing competition makes effective and enforceable content regulation even more difficult, the role of a public service broadcaster—such as the BBC—with clear public obligations to ensure quality, distinctiveness and universal availability will become even more important.

12 April 1996

Figure 1

Digital techniques allow many different types of data to be stored in the same form and to be reproduced with no loss of quality.

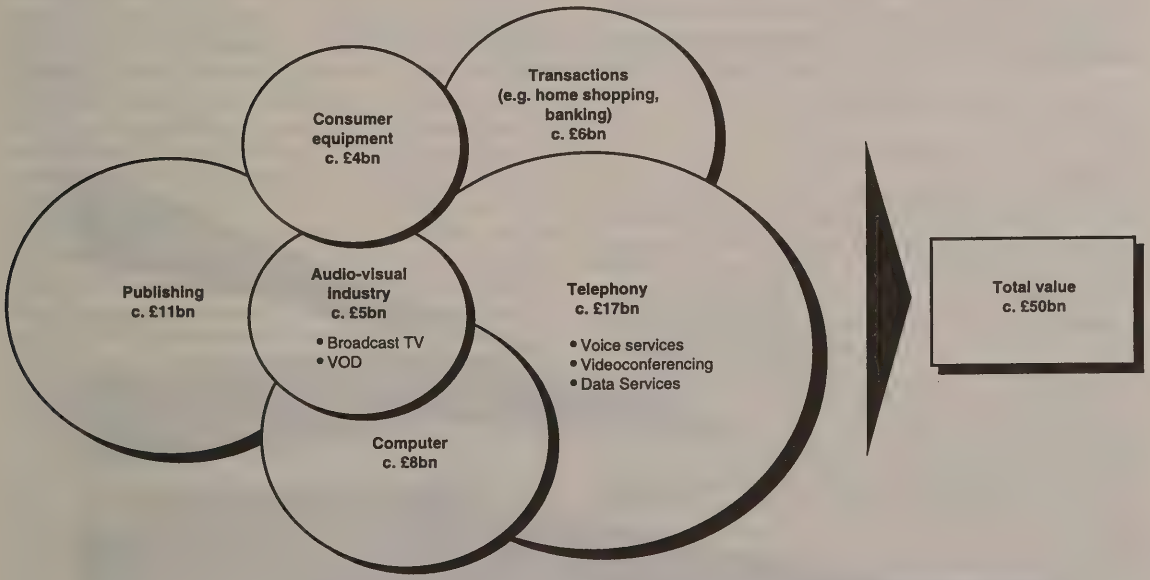
Digital Storage



Source: Screen Digest

Figure 2

Broadcasting, telecoms and computer markets will converge to create a £50 billion market



- Consumer take-up, outside the professional business sector, will be driven by entertainment and educational use, and be based on the skills and services of the broadcasting market

Figure 3

Gateways perform two key functions; for consumers, they act as a "navigator" for a range of products and services and, for suppliers, they provide a means of securing payment.

What does the Gateway do?

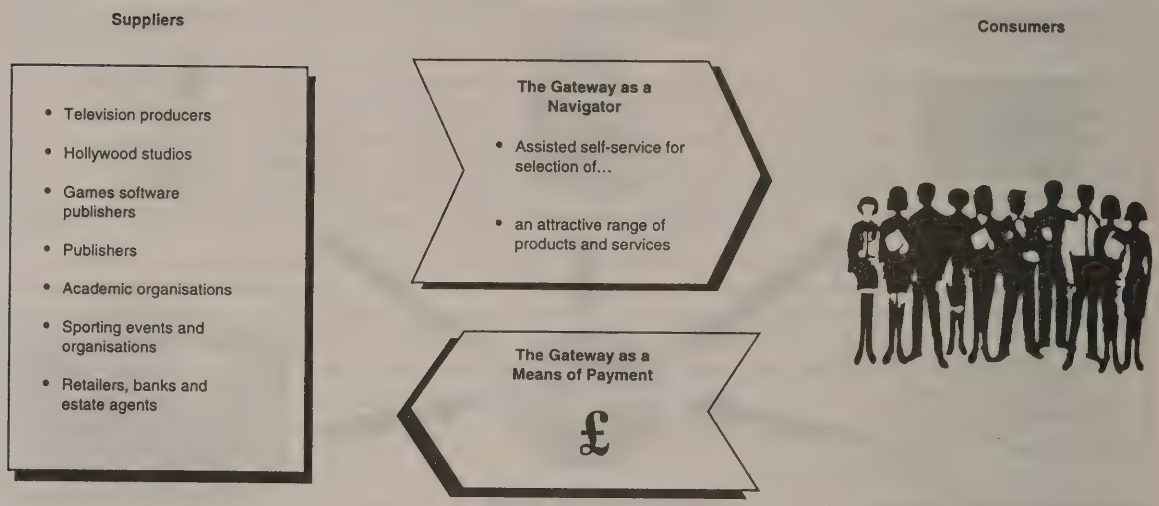
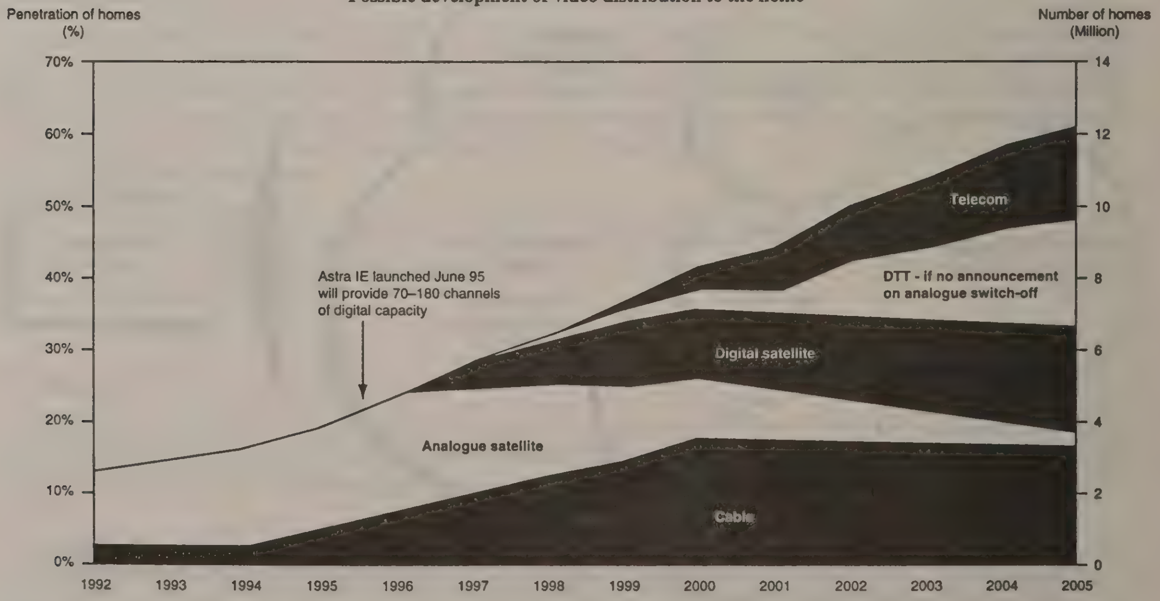

Suppliers
Television producers
Hollywood studios
Games software publishers
Publishers
Academic organisations
Sporting events and organisations
Retailers, banks and estate agents
The Gateway as a Navigator
Assisted self-service for selection of…
an attractive range of products and services
The Gateway as a Means of Payment
£
Consumers

Figure 4

But take-up rates among systems will differ. By 2005 it is likely that over half the UK will take at least one type of new TV delivery system, but this will be spread across at least 4 different systems.

Possible development of video distribution to the home



Source: Corporate Strategy

Examination of witnesses

MR ROBERT PHILLIS, Deputy Director-General and Chairman of BBC Worldwide and MS JANE DRABBLE, Director of Education, BBC, called in and examined.

Chairman

463. Mr Phillis, thank you very much for coming to see us and also Ms Drabble. Perhaps you would like to begin by telling us about your roles in the BBC and then making any sort of preliminary statement that you think would be helpful.

(*Mr Phillis*) Thank you very much, my Lord Chairman, and good morning. Thank you very much for the opportunity of being here today and for saying a few words of introduction. If I may introduce myself, I am the Deputy Director-General of the BBC and I am Chairman of BBC Worldwide which encompasses the BBC's international and commercial operations. My colleague, Jane Drabble, is Director of Education and it is our educational directorate which is leading the way in many of the superhighway initiatives. Jane and indeed the BBC are very much concerned with all of the formal and informal learning opportunities that may exist on the superhighway itself. We found in our note some difficulty in doing justice to the full scope of the information superhighways and the opportunities that the digital age may well deliver. I do emphasise, I think, the importance of the word superhighways in the plural because there is not a single superhighway, it is a mixture of opportunities, ways of delivering a whole range of information through a number of different channels. It is not restricted simply to delivering television or radio services. For the first time, I think the digital age and the superhighways provide the opportunity of delivering audio, video, and text which become a common currency to be delivered in many, many different forms to a number of different outlets, not simply the home but the workplace, libraries, schools and colleges. It is this multiplicity of linked means of delivery which we believe to be one of the great opportunities that exists for Britain in the superhighways. More narrowly, as a broadcasting organisation, we have one obvious concern. Our core services on television and radio are funded, of course, publicly by the licence fee. It is paid for all and we believe therefore that those core services should be available to all. Until now, in an analogue world, that has been straightforwardly achieved by analogue terrestrial transmission from masts on hills. In the digital age there is going to be a whole range of means of delivering terrestrially, by cable, by satellite or indeed by telecommunications links. So we do believe if the publicly funded channels, or perhaps broadening it, the free to air channels—and one would include ITV and Channel 4 within that—are to be available to all who pay for the licence fee then we believe the BBC and other free to air services should be present on all those systems. I hope that in the discussion it will become apparent though that we feel the BBC can contribute in many more ways to the nation's life than simply our existing core generally available broadcast channels. The Internet is one such opportunity and I am sure that Jane will be happy to expand on some of those opportunities in formal and informal learning in the course of the discussion. Just as background, my Lord Chairman, both Jane and I have represented the BBC on a number of fora looking into superhighway questions both in Europe and here in Westminster. Those Committees have looked not simply at the broadcasting opportunities but the opportunities that the superhighways and the digital age may offer for health, for education and for learning more generally. Obviously in so far as we are able to answer any of your questions on those areas we will attempt to do so. Thank you very much.

464. Thank you. Could I begin by saying I suppose many of us initially would think of the BBC as one of the major content providers worldwide. To what extent are you actively re-purposing, I think is the technical word, all that material that you hold for use in the new media as they develop?

(*Mr Phillis*) We believe too that the strongest asset the BBC has and can bring to the superhighways and the digital age is indeed our programme content and services that we can provide. We think it is an essential part of planning for the BBC's future strategy to ensure not only that that content and those programme services are available by the traditional means of broadcast delivery, but that we can extend the availability, the understanding, and the range of information and supplementary information that the on-line services of the superhighway will allow us to exploit. It is very much driven by the belief that irrespective of the technology in terms of the services to the citizen and to the consumer, it will be the content of programmes which will attract and stimulate and draw people to the new means of delivery.

Baroness Hogg

465. I think that leads naturally to the first question we are particularly interested in this morning. Could I go on then to ask whether in your view it would be fair to say that the BBC views control of the gateway as the main barrier to the BBC's potential to become one of the key players in developing digital services?

(*Mr Phillis*) Yes, Lady Hogg, we do believe it to be a very key issue though I would again say that the superhighways are not simply about digital television channels and in so far as the other dimensions of the Internet and on-line services are concerned there are different issues perhaps which need to be addressed. Certainly in relation to digital television services the importance of access through those gateways, which allow service providers access to the citizen, the viewer, the consumer, the listener, is we believe a very important issue to ensure that there is an appropriate regulatory framework to ensure that access is not denied.

Lord Flowers

466. I could go on from there, talking about the regulatory framework and ask you whether you are satisfied that this includes sufficiently strong anti-monopoly powers to prevent market distortion?

Lord Flowers *contd.*]

(*Mr Phillis*) I think in the last year there has been some very considerable clarification about the sort of regulatory framework that might emerge and the DTI's consultation paper on licensing and regulating conditional access and subscriber management systems through Oftel we believe to be a sensible approach and one that we support. I think the Committee will be aware that the DTI's consultative paper proposes that there should be separate licences issued to conditional access systems and to subscriber management systems, that they should be separately accounted for in the finances of the organisations who operate such systems, that there should be open and fair and reasonable access for other service providers. I believe, my Lord Chairman, that is a very important point. That links, of course, to the fact there should be non-discriminatory tariffs in terms of the pricing to those that wish to use such systems. These points are covered in the DTI's consultative paper. I think there are a number of points which perhaps deserve some consideration within that regulatory framework. We believe there is a case that the tariffs for access to such services ought to be published so it is clear to any provider of services the charges that they would have to bear and that they are broken down between the various parts, by that I mean the subscriber management systems which some want to use and the encryption and decryption systems which others might wish to use. I think a final point which would concern us as broadcasters is that there should be open or shared technical standards across all such conditional access systems to avoid the unnecessarily wasteful duplication systems which would require an individual citizen or householder to have more than one decoding box within their home. That inter-connectability, those open standards we think are important issues also. Whilst the regulatory framework is obviously deeply important I think the way in which it is applied is equally so. On all such matters one would like to hope that means are delivered where there is speedy and effective enforcement of any such licences or conditions but I think broadly the progress that has been made over the last 12 months the BBC would support.

467. A number of our witnesses have said something to the effect that the present regulatory system as operated by Oftel seems to imagine that you can treat the whole thing on a United Kingdom basis whereas the superhighway is global if anything and much of what you do is global also.

(*Mr Phillis*) That is right.

468. For that aspect of it Oftel's regulatory framework is not appropriate, that is what has been said to us. Have you any comment?

(*Mr Phillis*) I think on the face of it, my Lord Chairman, that must be true but of course the positions that we have made in our submission and to which I have just responded are equally applicable also to Brussels and to European legislation. Certainly the BBC has been making these general points of principle known and explained within Brussels and within the European Union which is obviously an important extension to that requirement.

Lord Gregson

469. Are you satisfied that devices like encryption and so forth are sound enough to enable the sort of services that you are talking about to be conducted properly? I am thinking about the fact that you can now buy in Amsterdam decoders. There is a *Hacker's Monthly* available now which gives you all the information you require to make your own. It has never been possible, even the Department of Defense in the States have never been able to secure their systems despite their vast expertise that goes far beyond anything that has been done on a commercial scale. Do you think this is a possible threat to these complex systems that are now being put into place?

(*Mr Phillis*) I do not think anyone can ever be totally confident that the systems are absolutely secure—

470. We know they are not.

(*Mr Phillis*)—there will inevitably be a growth industry for those that choose to pirate or to hack and there is always that risk. I think it is incumbent on those that provide the various encryption systems constantly to be trying to improve and ensure the necessary security requirements that you allude to.

471. The question I want to ask is do you think it will ever happen?

(*Mr Phillis*) I believe it will be a constant process of competition between the providers of the service and those that are always trying to find ways of cheating the system.

472. Do you think they will ever win?

(*Mr Phillis*) I am afraid I could not venture an opinion genuinely because I am not sufficient of a technologist to know what developments there might be in that area. You point out very properly the risks and dangers of such systems.

Lord Haskel

473. Coming back to the regulatory framework, I wonder if I could ask a rather more commercial question. As a public service broadcaster financed by a licence fee, do you feel that you should have to pay for access to the information superhighway? Do you feel that your's should be a public service which you should not have to pay for because in a way the public has already paid once by virtue of the licence fee or do you feel that you should pay for access like every other organisation?

(*Mr Phillis*) I think the BBC has a number of different roles both as a provider of services being our prime purpose and the majority of those services being of a public service nature, although certainly the commercial opportunities to provide services on the superhighways are something we are very well aware of and indeed will attempt to exploit to the benefit of the licence fee payer by generating supplementary income. I think in so far as we are looking for access to a "must offer" requirement by satellite delivered systems, yes of course we expect to have to pay for the transponder and for the decryption of services, and rightly and properly so in terms of the user. Our concern in that respect is that the services are on offer to public service broadcasters or other free to air services on appropriate and fair

Lord Haskel *contd.*]

terms but clearly we have to pay for that transponder or we would have to pay for the decryption. The real question I think is one of access.

Lord Craig of Radley

474. Mr Phillis, in your written evidence you draw attention to householders choosing a single delivery system for all services. This is talking about the digital terrestrial transmissions when they replace analogues and I think this follows on from what we have just been saying. You make reference also to the fact many of the conventional television aerials have fallen into disuse in Germany already. What lessons do you draw from this, particularly in relation to your point about the importance of the public accessibility being guaranteed through the other providers, whether it is cable or satellite?

(*Mr Phillis*) The evidence we have from Germany, where there is a much more developed cable distribution system as well as an emerging satellite delivery is that now less than half of homes in Germany rely on the traditional terrestrial aerial to receive their signal. The lesson I think we draw from that is that here is very clear evidence of the more complicated digital age with a mixture of distribution systems. As you have outlined yourself, the requirement for "must carry" in terms of the cable or "must offer" in terms of satellite are the means by which one can ensure that the free to air services, and obviously our interest is the BBC, are made available. It is that sort of evidence which underlies our position as far as that is concerned. I think also if there is a "must offer must carry" guarantee provided for in the legislation then not only is it more likely that individual citizens and consumers will avail themselves of one or other of the new technologies but I think it will speed up the move from analogue to digital systems which ultimately as a matter of policy may allow a Government at some future date—because obviously this is going to take a long period of time—if they so wish to consider moving from a mixed economy of analogue and digital to a totally digital broadcast system.

475. Do you think it is going to be possible by legislation to make it absolutely clear what must be offered and what must be guaranteed?

(*Mr Phillis*) I do if the regulatory framework is so provided. We are encouraged that the Government has taken account of the "must carry" requirement as far as cable operators are required and, as you know, in that context under the various copyright legislation the free to air services are provided free of charge. I think that is right and proper in order to stimulate the growth of the cable industry. Equally, I think it is a reasonable quid pro quo to expect in return for that provision of services without charge that the cable operator should be required to carry them as a matter of course. I think as far as satellite delivered systems are concerned—and there I draw the distinction between "must carry" on cable and "must offer" on satellite—the requirement I believe should be only to make available on non-discriminatory terms access to the public service or free to air providers but obviously we would have to pay the proper and fair commercial charges to secure such carriage. We would want to ensure as a matter of policy the BBC services are available across all three means of delivery: cable, satellite and terrestrial delivery services.

Lord Butterworth

476. This theme you helped us over quite rightly from your introductory remarks onwards about the existence of public service being a consequence really of the licence. Because of this I understand your position to be that on any of the channels you would wish to see the BBC public service put out because as we go to digital transmission households may well choose a single method which would cause you to be excluded in a sense. Well now I would like to try and help you if I can, you have painted one logical conclusion but of course there would be another, would there not, and that would be to say: "Let us abandon the concept of the licence fee altogether". I wonder whether you would like to elaborate what you were saying in your introductory remarks having that point in mind?

(*Mr Phillis*) Thank you very much indeed for the question. I think there are two points I would like to make and I am sure Jane would like to add to them. The first is that as a public service broadcaster it is our responsibility and obligation to make programmes across the whole range of output to appeal to all ages, to all classes, to all interests, whether they are extremely popular or only mildly popular or appeal to a particular audience. One of the responsibilities we have as a broadcaster and programme maker is to ensure that the range of programmes we make, appealing to all of our licence fee payers, is at the top of our requirements. That is a mission and a purpose that we believe very strongly an organisation like the BBC has to adhere to. Secondly, it is not simply the provision of programmes on those distribution channels, it is maintaining the programme production base within Britain and making our contribution to the maintenance of the very high level of skill and creative ability that British broadcasting I think is rightly renowned for. It is only, we believe, through a publicly funded BBC, through the licence fee, which creates that stable source of income allowing us to fulfil those two purposes. We do not believe that without proper and adequate funding either the range or the quality or most importantly the maintenance of a British production base, as opposed to simply filling this multiplicity of new channels by imported and bought in programmes, is something which we could adhere to. The production base and range and quality is fundamental to that concept of public service funding and also the ability to provide those services without being driven simply by the maximisation of audience ratings. That means making those programmes available at times and in ways which perhaps other differently funded broadcasters are unable to do.

477. What you are saying is the base and the range of programmes could not be guaranteed save through the funding of a licence fee?

(*Mr Phillis*) Yes, my Lord Chairman, that is precisely what I am saying.

Chairman

478. Do you wish to add to that, Ms Drabble?

(*Ms Drabble*) I would add simply, my Lord Chairman, if I may, that as Bob has said the licence fee carries with it an undertaking to the general public that we will meet all their interests and all their needs. Certainly from the perspective of education we build our service on the basis of a very close analysis of audience need, totally uncluttered by ratings questions or commercial questions. We are able to use our assets in a very particular way in the public service and I would cite to you particularly a campaign we ran last year to promote adult literacy, a very important area, of course, of education and social need, not an easy subject to get through to the most needy people about. We were able to use BBC1, which is our mass channel where we can reach millions of people, to produce a very, very highly targeted and extremely good looking campaign in association with the Basic Skills Agency, and this resulted in 300,000 people in a week calling in to a free telephone number for a free pack to help them help their children to learn to read and write. That is a good example I think of the sort of thing the BBC is committed to doing and which is part of our obligation because licence payers are paying for a service that they expect to get public service out of. I think there is a very strong case for keeping it.

Lord Gregson

479. Public service broadcasting to me implies more than the areas we have covered already. We are gradually in this country moving towards a freedom of information situation. Would you see public service broadcasting as the means of disseminating that sort of information? In other words, you have certain situations where the ordinary citizen wants information of a Government situation, at the moment they go to the Citizens Advice Bureau, would you see your duty in effect, if we had that sort of service available, to provide that sort of information on the Internet? If you do not do it who else would, let us put it that way round?

(*Mr Phillis*) I think that the concept of the superhighway certainly provides that opportunity for the nation to access a far wider range of information in the way you outlined. I think our role is very much in providing information which stems from or is related or supports the range of programmes we are responsible for. That does not mean limited simply to the programme content programme by programme but all that additional information which can and should be provided, for example, in relation to our news and current affairs and political coverage, our educational coverage and so on. 480. I am not talking about that sort of aspect, I am talking about direct information that the citizen needs and has a right to have. If there is a change to the Social Security Act it can affect millions of people, at the moment it is published in the newspaper probably as a small article or it becomes a leaflet pushed through the door. It is a very, very limited scope compared with America, for instance, where public service broadcasters have a duty in effect to carry this sort of information.

(*Mr Phillis*) I think, my Lord Chairman, very clearly the BBC would expect to play the fullest possible part in such a network and such a system.

481. Would it not be an essential part?

(*Mr Phillis*) It is a major part but not something I believe which the BBC could carry alone for two reasons. First of all, I think as a nation we need to have an infrastructure where there are access points to the superhighways, not simply in schools and colleges but also in Citizens Advice Bureaux and libraries and other institutions where the citizen can have access to a terminal and pull down this information. Part of it is an infrastructure situation.

482. Who is the service provider in that case?

(*Mr Phillis*) The service provider I think would be a number of different sources of which the BBC will be one major provider but there are other information providers who would need I think to access and make available such information in addition to the role that we can play ourselves.

483. You are implying, therefore, that people like the Department of Social Security for instance, who have their own method of delivering this information, could become a service provider in themselves or would you have commercial service providers being contacted by such bodies? Does it make sense to you, this duplication when we have a public service broadcasting system?

(*Mr Phillis*) I think your line of questioning very much illustrates the importance that there is not a single superhighway but a number of different sources of information which people can make available. If the thrust of your question is should this be freely available to the citizen, yes that is a point that I agree with and we would support, but that is not to deny that there may be other information providers who are making it available. I do not know if, Jane, you would like to say anything?

(*Ms Drabble*) I think what we are starting to see is Government departments and agencies posting information on the Internet for everybody to get access to. I think one role that the BBC can play and increasingly is beginning to play, certainly in the education context on the Internet, if you like, is as a trusted guide. What we do at the moment is provide a range of consumer programmes in the broadest sense of the word which, if you like, process the information or find out the sources of information for people and present them in an easily digestible way, perhaps through the programme or through the fact sheet and so on. I think increasingly what we can do is take people from the programme to a source of digital information, let us say at the moment it is the Internet, and then point people in the direction of other places they can go to find more places that we feel are good quality sources of information for them to search.

Baroness Hogg

484. It is often said that the development of information superhighways will lead to disintermediation so following Lord Gregson's point, because there is access through the World Wide Web to a number of Government sites, the need for an intermediary to perform that role is less apparent I would have thought. In your area of

Baroness Hogg *contd.*]

education it does seem to me there is a very important and traditional BBC role publishing packages and delivering services. The development of digital services will enable you to do this not just on the mainstream BBC channels so what I would like to ask you, if I may, is to what extent do you see a development of these services outside the traditional BBC channels and can that be carried on the licence fee or do we need to think harder about how the development of education services like the BBC would be funded or financed?

(*Ms Drabble*) Lady Hogg, I think the critical importance of the BBC and its value in the eyes of consumers, and particularly I am thinking now of teachers, is its trustworthiness and reliability. The other crucial aspect of it is the access to the wealth of talent that the BBC possesses and its ability to be able to produce at the moment programmes but increasingly multiple media which enrich people's experience and bring people into contact with the rest of the world.

485. Exactly.

(*Ms Drabble*) I think it is very important that the BBC does not lose sight of the fact, therefore, that its main function is as a broadcaster and that will give it and does give it now a vast wealth of material and talent from which we can tap to use for the benefit of education. I would hope that what the digital environment will give us is simply more and more opportunities to take people from the broadcast environment into other services, some of which of course will be paid for, charged for, some of which will be commercial. Also it will enrich, if you like, the overall proposition but keep the BBC as a broadcaster at the centre of it. I think if we depart from that then we lose our central role. It is very clear from the work we have done so far on piloting Internet services in schools and so on that the BBC is regarded by teachers in particular as a trusted force. Of course, when eventually we are able to distribute videos through easy means like the Internet and of course broadband and cable and so on then all the wealth of the resource that we have at our disposal will become even more accessible to people.

486. It is a potential for you to be broadcasting on so many more channels and of course the nature of broadcasting itself will change presumably and become interactive?

(*Ms Drabble*) Indeed.

(*Mr Phillis*) If I may add to that, my Lord Chairman, I think Lady Hogg mentioned a very key word and that is interactivity. One of the things which the digital age and the superhighways will allow, and particularly important in both formal and informal learning situations, is for individuals and citizens to interact with that additional material as provided outside of a straight forward programme broadcast, whether that is an on-line service, whether it is a CD Rom, whether it is access to additional text or audio or visual material. Supporting a theme is, I think, one of the greatest opportunities that exists here. We are not simply in the learning field but more generally exploring how on-line on the Internet, off-line on the CD Rom or particularly looking at how digital television might provide additional opportunities to provide specific information. We are developing a concept within the BBC where when we are able to make use of digital television transmission, terrestrially or by satellite, the opportunity to have additional—we are calling them side bands—where a programme may stimulate interest in a documentary or a learning programme of some sort, if the individual wishes to come out of that service to explore more detailed information in text or sound or vision, the range of the digital opportunity provides that facility. It is in that new dimension of interactivity, which allows us as citizens whether in formal education or more broadly wishing to expand our own knowledge of particular areas, that we think there is massive potential to be able to enhance that range of services.

Lord Craig of Radley

487. Can we follow on from that. You are relying very much now on the Internet, you have some 7,000 pages on it. The Internet is being subscribed to by many, many more millions of people and more and more material is being put on it. Do you find it a satisfactory medium? If you do, are you satisfied it will continue to be? If it is not, what do you think ought to be done about it?

(*Mr Phillis*) I think it is a hugely exciting medium with a potential not yet properly understood or defined in the way people use it or the way that it is paid for. I think it is a hugely exciting medium. I think there are a lot of questions that need to be answered in the way in which those services are paid for, be it by the individual consumer or by the institution or by Government or by advertisers or by subscribers. I think the long term economics of the Internet are still shrouded in a degree of mystery and uncertainty which needs a great deal of clarification. So the economic question I think needs to be refined and developed over time. I think the regulatory question also, and by that I mean access to pornography and those who choose to use the Internet in ways perhaps not envisaged by a Committee such as this, certainly raises the question as to what Government and governments can do to try to protect parts of our society from invasion of that sort of material. Again I am afraid I cannot offer answers to that question. We recognise at the BBC the need and the problem. The way in which it is to be addressed, I think, will be a mixture of technology on the one hand and of course regulation and legislation on the other, but they are very key issues that need to be resolved.

488. There are a number of issues here, and you have touched on two or three which are particularly of interest to us, the one about the content as to whether it is acceptable and it is not just the extremes of pornography or how to make an atom bomb but there are many lesser levels. To what extent do you think as the provider of material for entertainment or education you have a responsibility for marking it in some way to advise the consumer or viewer what is suitable or not suitable for the ten year old or the 25 year old or whoever it happens to be?

(*Mr Phillis*) We are absolutely clear that any programmes or services we provide by whatever means have to meet those standards that we expect of

Lord Craig of Radley *contd.*]

all of our programme makers for the services that we provide. Indeed, those standards, enshrined in our Producers Guidelines, and enforced and properly regulated by our Board of Governors are the same standards we would expect to apply to anything that we do. I think within that context where we offer indications or warnings of the content of certain programmes broadcast on radio or television, we would expect the same signalling indication of content on any BBC services that are provided. I would like to assure the Committee there is a very clear, not only understanding, but determination within the Board of Governors and the Board of Management that as we explore these new means of delivery we have to insist on that same rigorous application of standards. The signposting question has particular difficulties that you referred to, my Lord Chairman, in that of course one of the opportunities that the Internet provides is access at any time of the day for those who have the facility and ability to access that. We will do everything we can to indicate the nature of the programmes that we are responsible for and we are providing, whether that is through traditional programme guides or electronic programme guides or the indication of the content of the programmes that one is accessing.

489. Finally, do you, because you are using the Internet, in any way equate it with a universal access medium?

(*Mr Phillis*) I think one of the issues that we have within the organisation, and one of the concerns that I would have as an individual, is that although others from other parts of the world have talked glowingly and widely about universal availability of such systems within any society and around the world, in real terms there is a danger of a division between the information rich and the information poor, whether we are talking about differences between Britain and Europe and the rest of the world or whether we are talking about access within Britain itself, because the number of people who are able to access the Internet at the moment is, of course, very, very small. Jane, I think, has some more detailed information. I think the number of homes in Britain with access to a PC is running something in the order of 28 per cent but Jane will correct me if I have remembered that incorrectly. The number of homes that can access the Internet because they have a modem is not surprisingly at this stage of the development of the technology very, very small indeed. Although the potential and the opportunities are there, unless as a nation we create an infrastructure which allows much broader access to the opportunities of the Internet, unless through our schools and our educational establishments and our training opportunities we open up the possibility for people to have access and to know how to use it, then the potential will be limited. It is not a universal system at the moment and I think there are policy issues and infrastructure issues that obviously any government, including our own, properly needs to address.

(*Ms Drabble*) I would add simply basically—returning to a point I made earlier—I think that we can use, however, our reach as a broadcaster because we do reach into practically every home in the country in order to make the links for people and in order to expose the advantages of the so-called information superhighway in order to give people information about how best to use it and in order to try to motivate people to try it out, to go to their local library or to encourage their children or whatever is most appropriate, and to encourage a situation where we may not aspire to a PC in every home but we may aspire to every person having access to one either through their school or their work or through their local library. I think we have a very significant function, not just as a content provider but as a stimulator, if you like, of people's interest in using digital technologies to enrich their lives.

Lord Craig of Radley] So well that you got us computer literate with BBC Micro all those years ago!

Lord Gregson

490. There is a very strong opinion in the States that the Internet is over-hyped for education and there has been over a long period—you are longer in the tooth in this area than we are—the opinion that the only way forward in effect is either through such video instruction based on CD Rom or interactive video instruction based on CD Rom and this is now extensively used in the States, well developed by the Department of Defense in instructing and teaching their armed forces because they have a literacy problem which is much bigger than ours. I tend to agree with this. Certainly as a method of teaching for teaching core subjects Internet seems to be the froth rather than the substance of this situation in some of the teaching that is conducted by interactive CD Rom. Have you any opinion on this?

(*Ms Drabble*) What I think is going to happen is that we will see a mixture of resources being used.

491. Can you see a real need for Internet in teaching base subjects?

(*Ms Drabble*) Yes, absolutely, as a research base if nothing else and as a means of communicating with other schools, other children in other parts of the world.

492. That is the froth though, is it not?

(*Ms Drabble*) It is what the Internet does well.

493. It is very good at froth, yes I accept that.

(*Ms Drabble*) What I have seen happening in America, and I can see it increasingly starting to happen here, is classrooms in which teachers are using a variety of resources, and the wonderful thing about computer based technologies and linking through to the Internet or linking into CD Roms or whatever is that there is a massive range of opportunity there to send a child off to say "go and find that", or the teacher can sit with another group of children teaching in a conventional way to use the Internet to communicate or whatever. It opens up possibilities which are difficult to contain within a classic standard school library. I think we have to see it that way. I think we have to see it as an opening up and as a facilitating of dialogue.

494. Given the fact that our major problem in this country is core subjects and not the froth, should we not be able to use these technologies to improve our

Lord Gregson *contd.*]

core subject teaching which is letting us down badly by comparison with other countries in the world?

(*Ms Drabble*) I think some of the evidence, my Lord Chairman, is starting to point in the direction of children gaining confidence, children who might otherwise not score well in standard tests gaining confidence from using these technologies, from using word processing, from accessing the Internet, using E-mail. I know there is some evidence from America that this can happen.

495. Interactive video based on CD Rom is surely a new technology as far as children are concerned, there is not much difference except that it is all contained within the classroom and it is cheaper as well by the way.

(*Mr Phillis*) I think, my Lord Chairman, there is an evolutionary process going on. I do agree with you that on the current state of technologies that are available, interactive CD Rom and structured teaching in the way you have described it is extraordinarily powerful and it is, I think, more likely to emerge as a readily available system than the potential benefits that the Internet can offer in the immediate short-term future. I was, during an earlier part of this year, in the United States and I visited an educational centre that a company called TCI—Telecommunications Incorporated—has established in Denver and they were developing, I think, some hugely exciting Internet type services where taking simply the news agenda of the day pupils and students were able to explore the background in scientific terms or background terms, to access in far greater detail, for example, the Chernobyl crisis or events in the Middle East or whatever, and provide the background information which informed the students in terms of the events portrayed in the news. I think there are areas like that which illustrate the potential.

Lord Gregson] I am sure your technical department warned you about the enormous problems of providing the switching for this situation on a universal scale, it is just simply impossible, so you have got a limited technology before you start.

Lord Flowers

496. It is all very well making reports about Chernobyl and things like that available to school children but they are not there to learn about that. It is a good thing that they are interested and that will help their interest, of course, but this is what Lord Gregson was talking about, the core subjects. They should be learning, let us say, chemistry, not Chernobyl. There is a tendency, I think, for people who use the Internet to get, Lord Gregson called it the froth, the extracurricular activities. The whole business is so attractive that the tendency is that you will study the froth to the exclusion of the core and that could be educationally very bad.

(*Mr Phillis*) I am not for one moment suggesting, my Lord Chairman, that there is any substitute for proper rigour in the teaching of core educational subjects and disciplines in schools and teaching establishments. I was not intending to imply that. The example I was referring to was how, for example, a news story on something like Chernobyl could allow a class and students to explore some of the scientific questions underlying that and the environmental questions underlying that where an event is used to take a group of interested individuals, who might not necessarily be school children but at different levels of the educational system, to understand the background to such issues. I am not suggesting, and I am sure Jane is not suggesting either personally or on behalf of the BBC, that the Internet will ever replace the importance of rigorous teaching in our education establishments, for one moment.

Lord Gregson

497. Surely the point is this technology can be used for core teaching, it is a marvellous method of core teaching, should we not be concentrating on that?

(*Ms Drabble*) The most important point I would make is that the BBC is there to help teachers and to resource teachers and to use its talent and its assets in the best way it possibly can to resource the classrooms. This is what we do at the moment with the means of television and video and audio and this is where we will increasingly be using other media. Of course, these issues about core educational standards are critical and we will play an appropriate role in the provision of that.

Baroness Hogg

498. As you were saying a moment ago, penetration of televisions is probably far greater than the penetration of PCs. We have seen spectacular growth in Internet type services, partly at least because television at the moment is subject to the tyranny of the spectrum and the number of services you can deliver is limited. As you move into the digital age do you see the focus of growth shifting from Internet type services received on computer type services to television, interactive digital services received by television?

(*Mr Phillis*) I think from the BBC's perspective an essential means of delivery will be programme services across the airways in the case of radio or via the television screen. That is the focus of everything that we do. I think that it is unclear as to the extent to which the PC and the television monitor will merge into the same vehicle. There is a view that suggests that the PC, certainly with further technical development, will be capable of receiving reasonable, and perhaps high quality, visual moving pictures actually on the screen although there is quite a lot of refinement and development before that takes place. I suspect that both systems will work in parallel.

499. But the installed base of televisions is so much larger than the installed base of computers?

(*Mr Phillis*) Indeed. I think that the television installed base and the move to the digital possibilities is very much going to depend on the impetus that the television set manufacturers have, helped and encouraged one hopes by Government policies, to convert from analogue receivers to digital receivers over time. It will take quite a long time simply because of the replacement rate of television sets in the home. I think we will see, with suitable

Baroness Hogg *contd.*]

encouragement, the manufacturers developing digital television receivers and as that replacement market takes place perhaps the question of whether a future government—I say that because it is quite a period of time out—would ever consider switching off the analogue system to make the digital television set available. In parallel to that I think increasingly the PC will develop to allow pictures of quality to be received on the small screen. There is a non-technical question which is the way the television set or the PC is likely to be used in the home. Although things can change there is, I think, some evidence to suggest that people regard a PC screen as very much more a one-to-one work station or learning station, whereas the television set in the home is often used for a wider range of more social viewing.

Chairman

500. I am afraid time's winged chariot has overtaken us again. Would you like to make any short two sentence final statement or is that your last word?

(*Mr Phillis*) I think, my Lord Chairman, all I would like to say is thank you very much for listening to what we had to say today. If there is any further evidence or information that you require in your deliberations we would be more than happy to answer any points that you have or to provide further information if you so wish.

Chairman] If in retrospect you think you would like to communicate with us again we would be pleased to hear from you.

Memorandum by British Telecommunications plc

This memorandum, submitted in response to a request from the House of Lords Science and Technology Select Committee, is concerned with the development and applications of an information superhighway.

SUMMARY

We anticipate the evolution of a new information society which will cause profound changes to our daily lives. New multimedia services will reach our homes, offices, schools, hospitals and factories, and impact areas we cannot yet imagine. To succeed as a producer rather than just a consumer we must, in the UK, adopt the best technologies and positively encourage innovation and development. Sitting back and doing nothing is not an option.

The global highway will overcome geographical borders and redefine our working boundaries. Services and applications will be transportable from nation to nation in ways that were not possible in the industrial ages that preceded.

We believe the next few years will determine whether or not the UK becomes a major contributor to this global industry. The issues are complex: no-one can tell which services and companies will succeed. Global accessibility will provide opportunities in a global marketplace for strong competitive companies. However, none of today's companies worldwide can yet be considered a major player in the provision of new information applications and services. The stage is still clear.

The UK is already well positioned to build on strengths such as:

- an innovative media and arts industry
- the 50 per cent of video games software that originates here
- London as a major financial centre
- the use of English as the language of new technologies.

Timing will be a crucial factor. Nations that accept and encourage these changes will benefit—those that delay will not.

The Government must take the lead in creating an environment which accelerates the deveopment of the information society. This should provide incentives for innovation and the early adoption of applications, and encourage risk-taking.

The regulatory structure must encourage an entrepreneurial spirit. Commercial freedom to operate will be vital to both large and small companies, and rewards must be commensurate with risks. The current regulatory framework in the UK discourages investment in broadband infrastructure by the major telecommunications operators and so constrains the development of the multimedia market.

There shall be no initial imposition of a requirement for universal service. Only when there are sufficiently large numbers of people unable to gain access to fundamentally important services should steps be taken to redress the situation. Even then service providers should not be commercially disadvantaged by providing any universal service. Universal service will require subsidy, and great care needs to be taken, once commercial needs and costs are properly understood, to ensure that such subsidies are beneficial overall.

Standards will be important to ensure open access to information and interoperability between networks. Standards bodies will have an important role to play and should be encouraged. However, caution must be exercised when specifying particular standards ahead of the market place.

In summary, it is essential that the Government addresses urgently the issue of the information superhighway, taking the lead as a consumer of information services, and promoting conditions for its early development. Countries such as the USA, Japan, Australia and Singapore have identified the area as one of prime importance and have already begun this process. The UK must build on its considerable strengths and be prepared to take a lead in the ensuing information revolution.

Question 1 What is the current form of the "Information Superhighway", and how is it developing (i) in the United Kingdom and (ii) worldwide? What specific problems arise from incompatible networks standards and why are these incompatibilities arising?

DEFINITION OF THE INFORMATION SUPERHIGHWAY

The definition of the information superhighway as provided by the Select Committee implies the following characteristics:

- high-speed and capable of carrying "broadband" signals;
- two-way, or interactive and therefore demanding a "switched" network;
- able to carry all kinds of traffic; in particular voice, text, video, images (ie "multimedia") in a common digital format;
- easy to access and use and with "intelligent" systems;
- within reach of all the population or "ubiquitous";
- essentially "international" in character.

Although there are networks in place which deliver some of the above characteristics, there are none as yet which deliver them all.

THE CURRENT FORM OF THE INFORMATION SUPERHIGHWAY

The technologies that underpin current forms of the superhighway fall into four categories of transmission, switching, data storage, and bandwidth compression. These are described in Annex A.

CURRENT STRUCTURE IN THE UK

Most existing networks deliver either narrowband telephony services or analogue broadcast entertainment services. They do not meet the requirements for a fully interactive, broadband, switched, ubiquitous, digital superhighway outlined above. The pattern of ownership existing in the UK is as follows:

Licensed-Operator Networks. There are a number of networks which require an individual DTI licence under section 7 of the Telecommunications Act 1984, and which are owned by specific operating companies.

Public Telecommunications Operator (PTO) networks, including BT's, are principally designed for widespread delivery of telephony services. BT already uses broadband optical fibre in the core network (between telephone exchanges) where some 2 million km have been installed, and to a much lesser extent in the access network (connection from exchange to customer) where some 25k businesses now have fibre connections. Integrated Services Digital Network (ISDN) connections provide multiple 64kbit/s digital access channels to premises in the UK, and are growing rapidly. However, the access network consists largely of copper pairs carrying narrowband voice traffic.

Business data networks are a more recent development. In many ways they can be thought of as superhighways, although at present only major institutions can afford them. One example is BT's Switched Multi-megabit Data Service (SMDS). This delivers switched, digital, broadband connections to major business and institutional users. It is the foundation for the UK SuperJANET network, linking computer sites at some 40 universities.

Cable networks are being built in parts of the UK. Cable companies are PTOs but provide cable TV services as well as telephony. Most of these networks deliver one-way broadcast distribution of analogue TV signals, and so presently fall well short of the requirements for an information superhighway.

Cellular networks offering mobile radio services using cell-phones are expanding rapidly. They focus on voice and narrowband data communication, and their spectrum allocations reflect this use.

Satellite TV distribution networks are currently based on one-way analogue distribution but return channels can be provided over land lines.

Other commonly-owned Networks: Internet is probably the closest current contender for the information superhighway, although it lacks the capacity to satisfy the growing demand for interactive multimedia applications. In essence, it is a packet switched network, using routers (data switches) rather than standard circuit switches. In general, local access to the Internet is provided by PTOs using data modems operating over standard copper pairs, and connected into routers via standard telephone exchanges. Currently services provided over the Internet are lightly regulated, as data, rather than as telephony services, although Internet telephony is now possible.

Current Regulation in the UK

The aims of the regulatory framework in the UK are to encourage competition, promote new entrants to the market, reduce prices and encourage improvements in efficiency. This framework applies primarily to BT and focuses largely on telephony services although Oftel is now turning its attention to the needs of service providers more generally.

Price control, and the debate on its continuation, contributes to the depressed shareholder value of the whole UK telecommunications sector. Control of BT's prices effectively constrains prices in the whole market. This risks discouraging investment in the UK by all the leading players.

Market entry assistance for other companies has restricted BT's ability to use new technologies, such as radio tails, and to offer new services such as broadcast TV. These restrictions continue despite the growing maturity of the market. They are holding back the growth of the multimedia service sector, as this will only flourish when a new superhighway is available across the UK. In our opinion BT is one of the few companies able to provide such an infrastructure once regulatory, technical and economic conditions allow.

BT has offered to provide free broadband connections to schools and similar institutions, in the context of a general and commercially justified programme to build a broadband network, on the assumption that BT was allowed to provide broadcast entertainment services.

Developments by BT

Developments are being made by BT on all fronts.

BT already uses ISDN as an interim medium band connection and is trialling technologies such as Asymmetric Digital Subscriber Loop (ADSL) which delivers bandwidths of 2 Mbits/s and more over copper pairs, allowing distribution of video signals to the home.

BT now offers connection to the Internet. The number of Internet users is growing at a rate of 10 per cent per month, to the point where performance is becoming an important issue. The advent of full broadband applications and the expanding number of connections may require the adoption of new packet or cell switching technologies, currently being investigated by BT.

Moreover, BT is now developing a potential superhighway based on hybrid fibre/copper technologies. The scope for this was not envisaged as recently as two years ago. Optical fibre would be taken to within a few hundred metres of the home, where electronic equipment would be used to provide a very high bandwidth connection over an existing copper pair. By re-using existing cable, this technology would be a very cost effective solution, as well as minimising disruption to streets and highways.

BT believes the new broadband switching technologies together with hybrid fibre/copper access connections could form the basis of a low-cost information superhighway available across most of the UK. This would require an investment of several billion pounds funded by borrowings and profits, and would have to be commercially justified. The exact form of the network is still uncertain in view of rapid developments that are taking place. The final outcome will be shaped by commercial issues such as customer requirements and technological change.

Worldwide Developments

The main aims of the many service development initiatives across the globe are to improve business efficiency, international competitiveness and the quality of social services (eg to the disabled community).

A recent G7 Ministerial Conference proposed a new "Global Interoperability for Broadband Networks" (GIBN) initiative to promote pre-commercial trials of broadband services and applications. The initiative will establish international links between North America, Europe and Japan to encourage the development of new services, and co-operation and interoperability on a global scale.

Within North America, the USA is beginning to pull ahead of the UK in terms of its commitment to the superhighway. The Clinton administration has made the Information Superhighway a high profile issue, backed up with positive action. A recent landmark Act has removed regulatory barriers between telephone, cable and broadcast industries. Many of the US Regional Holding Companies such as NYNEX and Bell

Atlantic, have publicly announced their commitment to the deployment of the Information Superhighway within the next five years.

European countries such as France and Germany have also announced their intention to invest, driven by a less liberal regime, which allows little competition for infrastructure. The "Autoroute d'Information" study by the French Government suggested an £18bn investment by 2010 and is seeking business partners.

Within the Asia-Pacific region, Japan has recently announced its commitment to a superhighway completed by 2010 at a cost of £100bn plus. Singapore has announced its "Intelligent Island Vision" with a plan to commit to fibre in the home, with a completion date of 2000. This is an expensive option, which could only be justified in a monopolistic environment.

STANDARDS AND INCOMPATABILITY

Standards in Telephony Networks

Standards are a significant issue for telephony networks. They enable end-to-end delivery of services across networks and drive down the costs of commonly available equipment. BT actively participates within all major standards bodies and encourages the adoption of agreed standards.

A recent example of the adoption of standards is Group Special Mobile (GSM), the European standard for digital cellular systems that now allows interoperability across Europe on equipment from different suppliers.

It can take time for the main network standards bodies (such as the International Telecommunications Union (ITU) and the European Telecommunications Standards Institute (ETSI)) to reach agreement. This can lead to operators adopting local variants for a particular technology, confined to particular geographic boundaries and to particular equipment suppliers. The problem has been dealt with by installing "gateways" at interconnection points between networks so that end-to-end delivery can be offered.

Standards in Broadband Networks

New standards bodies or self-interest groups driven by major commercial interests, such as the Digital Audio Visual Council (DAVIC) have been established to promote standards in broadband networks, and have streamlined the standards making process. These bodies will help set service performance standards as well as technical interconnection standards, to help ensure uniformity of service characteristics.

The superhighway at the international level will initially become a network of interconnected national networks. However, performance and services will be limited until international standards are agreed and adopted. These issues could be avoided at the national level if an integrated network were available. The danger we face in the UK is a patchwork of local networks leading to inter-networking bottlenecks and lack of uniformity of service performance standards.

QUESTION 2 *What services are being provided, and should be developed/will be required, within for example the following areas: (i) public information, (ii) commerce, (iii) finance, (iv) education, (v) industrial training, (vi) health, (vii) social services.*

We are still in the early days of the information society. Services being provided now are shaped by the as yet limited availability and capability of the underlying networks. Many of the services will not require high bandwidths and could be delivered using existing networks. However, these narrowband applications are pointing the way to broadband and demonstrate the need for higher bandwidth applications.

As well as the developments discussed here, we believe that entirely new activities will emerge. The Internet, for example, has already generated new pastimes such as "surfing the net" and exploring Cyberspace and new products such as interactive magazines.

The discussion below includes description of developments and trials that BT and others have begun.

PUBLIC INFORMATION

The information superhighway will enable faster and easier communication between the public and the whole range of public bodies. Several government departments already publish on the Internet and responses from the general public can also be made available. We can expect an increase in the volume of information exchanged between public bodies and those they represent, bringing improved accountability and greater democracy.

BT Interactive TV is a trial involving 2,500 homes, 5,500 people, 8 schools, 4 public access terminals in Colchester and Ipswich. It combines the telephone with the television and offers nine main services: children's TV, movies on demand, television programming on demand, music videos, High street (incorporating home shopping and home banking), games on demand, Adland (an interactive advertising service) and Local Life.

The Local Life service is a free service covering a wide range of material of interest to people within their own locality such as local news, local advice, local leisure and local emergency services. Information is supplied by nearly 100 providers such as local authorities, the local job centre, TEC's Police, charitable and voluntary groups, citizens advice bureaux, clubs and societies as well as the local residents themselves.

Multimedia Kiosks is a trial involving 250 London sites to test the market multimedia kiosk concept. Will provide information on travel timetables, advertising, hotel and theatre booking and some business sites with commercial information.

Portable Travel Information Terminal trial is based in Scotland and involves approximately 100 people to understand the potential for commercial mobile multimedia services to aid travellers. Previous trial results have shown that people are keen to have a travel service and are prepared to pay modest amounts for solutions to problems.

COMMERCE AND FINANCE

Easier access to information will stimulate a more efficient and dynamic economy. Indeed, the *raison d'etre* of many financial institutions is to facilitate the flow of information. Services such as BT Online Information Service and BT Construction Online provide specific information to meet the needs of particular groups. More advanced services such as City Media Network Services will provide business customers with rapid and easy access to video pictures.

City Media Network System is a London based trial with the purpose of providing financial TV services, training services and media information.

BT Construction On-Line is now a product to provide on-line information for the construction industry using Internet and ISDN.

EDUCATION

Similarly, easy access to information will facilitate and enhance teaching methods. BT's recently issued guide to teaching and learning with the Internet gives many examples of how this can be done. BT's CampusWorld uses Internet technology to link schools to educational material: BT Interactive TV is available in eight schools, providing TV programmes linked to the national curriculum.

As useful as technology may be in supporting education in schools and colleges, its real power may well lie in supporting learning throughout individuals' lives, helping them to develop new skills and abilities. BT Interactive TV, for example, carries nursery education, adult literacy programmes and advanced education from the Open University and the Industrial Society.

Tomorrow's Customers trial involves six schools in Suffolk and Wales to investigate new learning environments based on the latest telematic technology by establishing a learning test-bed in a selection of schools. Preliminary findings demonstrate improvements in children's organisational, communication and research skills.

Televersity. The Trial is based at Suffolk College and covers the Suffolk and Essex areas to investigate the concept of a university based upon a telematic approach to learning.

CampusWorld is BT's on-line curriculum support service targeted at schools and Colleges of Further Education in the UK and overseas. It was re-launched in September 1995 offering access to the Internet, along with e-mail, file transfer and access to information databases such as the Financial Times Profile. The content available on CampusWorld is produced to support the national curricula by two teams of educationalists, one generating material and projects for the primary schools, and one for secondary schools and Colleges of Further Education.

CampusVision is a distance learning platform. Over the next year BT aims to increase substantially the number of schools using video conferencing to deliver elements of the curriculum. A number of applications have been developed such as "virtual sixth form" for A level students and "virtual extended primary schools" for small remote primary schools. Both of these applications have been piloted to great acclaim in Gwynedd and Argyll and Bute respectively.

SuperJANET is a truly broadband information network, linking up a number of universities in the UK and overseas. SuperJANET can be used for a variety of applications, including, for example, distance learning, group collaboration, and remote access to information and expertise. BT has worked closely with UKERNA and the Higher Education Funding Councils in developing this new resource.

CampusConnect. For educational administration BT has developed CampusConnect. This value-added data networking service allows schools and colleges to communicate with central and local bodies. It is currently used by exam boards to disseminate exam statistics, including results.

INDUSTRIAL TRAINING

Companies are already looking to the information superhighway to help them provide ongoing training for their people. One element of City Media Network Services is an alliance with Video Arts to make their training videos more readily available.

HEALTH

Remote health services are being developed, both at the information provision and remote expert level.

Teleconferenced Medical Consultations. A trial based in North London is studying the impact of low-cost video conferencing over ISDN2 for remote patient referrals by GPs to secondary health care. It involves the Whittington Hospital London, the Royal Free Hospital London and 10 GP practices.

Health Net Programme. BT is currently exploring telemedicine opportunities under its HealthNet programme and has been a key player in the following trials: the Minor Injuries Link at the Riverside Trust, Westminster, to enable on-line access to remote expertise at the Belfast Royal Infirmary. It is proposed to extend the system to enable the establishment of peer self-help groups; the Immediate Care Link to connect a GP practice in Peterhead with a consultant at the Aberdeen Royal Infirmary; and the remote foetal monitoring sysem to transmit real-time foetal ultrasound images over the ISDN30 network from St. Mary's Hospital, Isle of Wight, to Queen Charlotte's Hospital, London.

Prescription Databases. On a more administrative basis, BT is currently working with regional health authorities to trial services for GPs such as prescription databases with the possibility of evolution into on-line access to patients' notes and a broader range of diagnostic support services.

SOCIAL SERVICES

By using information technology to make information available to the public, social services will be able to free-up resources to focus on more personal care.

Information Needs of People with Disabilities. BT has funded a study of the information needs of people with disabilities, the elderly and their carers. This study showed the particular importance of accessible information to these groups of people. One aspect of the work being funded by BT is a study of the possibility of remote unobtrusive monitoring of the elderly to give them greater independence in their own homes. It is thought that this will allow for the early warnings of the onset of health problems and thus allow for many of them to be remedied without the need to remove the person from their home, thus enhancing the quality of life for the elderly and significantly reducing care costs.

QUESTION 3 Who will supply these services to consumers in the United Kingdom? How can the participating companies be categorised and what is the nature of the commercial relationships between them? How are suppliers likely to develop? What service standards exist and how are they likely to evolve?

COMPONENTS OF SERVICE PROVISION

There are four main elements to service provision.

Customer Equipment Suppliers. Customer equipment includes TV sets, satellite dishes and set-top-boxes used to interface to broadband networks, PCs and their software, modems used to access the Internet, telephones and facsimile machines. Suppliers include consumer electronics companies such as Sony and Philips, set-top-box suppliers such as Apple, PC companies such as IBM and Compaq, and software providers such as Microsoft. Telephony handsets are retailed by BT but also by many other suppliers such as GPT. Cellular handsets are supplied by Motorola and Nokia among others.

Networks Operators. These include the cable companies and BSkyB, offering broadcast services, the PTOs, such as BT and Mercury, and Cellular network operators including Vodaphone, Cellnet, Orange and One-2-one. Internet providers include the universities and the Microsoft Network.

Service Providers enable services to be provided over networks and information to be stored and retrieved. They also package materials, for example by creating TV broadcast channels from individual programmes. Existing service providers include broadcast entertainment operators such as the cable operators and BSkyB (who are vertically integrated with their network operator business), and the BBC and ITV. The Internet service providers such as Demon come into this category although they straddle the service/network operator boundary as they also provide gateways into the Internet. This sector also includes companies that provide home shopping (Home Shopping Channel) or telebanking banking services (First Direct).

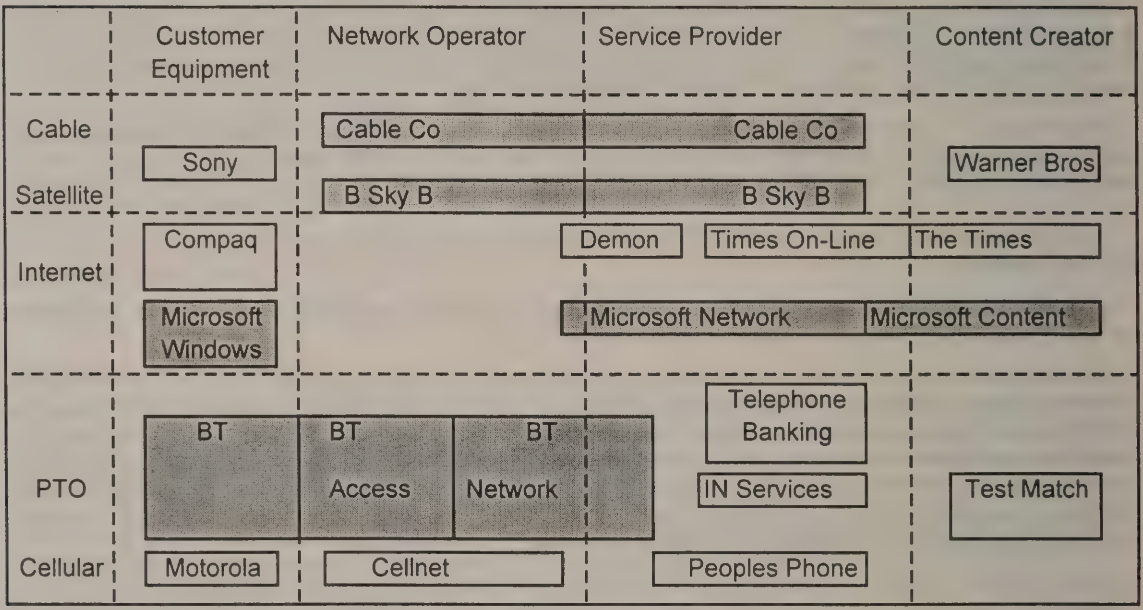
Content Creators includes film and TV programme makers, new organisations and publishers. Content creators include Warner Brothers and Carlton, book and journal publishers such as Wiley and news agencies such as Reuters and The Times.

The demand for on-line information is leading to the emergence of a new industry—*content re-purposing*—where existing information sources are converted from their original form into a form suitable for electronic storage and distribution. This could be from a paper-based form into on-line text or, in the case of video material, from video-tape into an appropriate on-line digital encoding (eg Motion Pictures Experts Group, MPEG).

INTER-COMPANY RELATIONSHIPS

Figure 1 shows how companies cover the four areas described above. Some companies will specialise and become part of an overall value chain, whilst others will vertically integrate (vertically-integrated companies are shaded in the Figure below).

Figure 1
The Structure of the Market and some Current Players



BT'S POSITION

BT is vertically integrated to a certain extent in the telephony market, whereas the cable and satellite companies, as well as Microsoft are vertically integrated in the broadcast and Internet markets.

Within the area of telephony services BT is a network operator as well as offering customer equipment. BT is also moving into the provision of services for the Internet, but is far from a major player in broadband services.

The broadband market is dominated by cable, satellite and terrestrial TV companies and software developers. These companies already have a major presence in more than one domain. BT's market position in telephony does not extend into this area.

SUPPLIER DEVELOPMENTS

Some companies will specialise and become focused on one of the domains in Figure 1. For example, Reuters and Dun & Bradstreet are now beginning to divest peripheral activities to concentrate on on-line information production, leaving the supply of service and network operations to other players.

Other companies may diversify. Content providers are becoming service providers, offering direct access to their content. A good example is The Times On-line, which only recently decided to offer content directly over the Internet.

Vertical integration could prove to be valuable in developing new markets. Structural separation is not needed to achieve competition. Large and small companies should be encouraged for the innovation they can bring.

Regulation will be a key factor. It must be as light as possible, to encourage entrepreneurial spirit. Commercial freedom to operate will be vital. The current regulatory framework in the UK may help to bring competition to the telephony market but it will inevitably constrain the development of the multimedia market, since investment in broadband infrastructure by the major telecommunication operators is at present discouraged.

SERVICE STANDARDS

Reliability

Two PTOs (BT and Hull Telecommunications) are subject to detailed service standards, setting targets for reliability and quality of services offered to customers. No such standards apply to existing broadcast TV services, and of course have not yet been formulated for interactive multimedia services.

Compatibility

Compatibility between services depends upon the adoption of specific protocols and interfaces (eg MPEG) and concepts such as universal service. These are addressed elsewhere in this memorandum in response to subsequent questions.

Other service standards are also likely to emerge in relation to the commercial and legal frameworks and will probably have to address security, fraud, confidentiality, copyright, liability, etc. In many cases service standards will emerge as part of brand integrity rather than through legislation.

Question 4. How can universal access to services provided for the common good be secured within a commercially competitive market framework?

Universal access to information services is not readily compatible with a commercially competitive market framework. This is likely to remain true for the foreseeable future.

However, commercial freedom to operate will be vital for both large and small companies, without any initial imposition of a requirement for universal service. Only when there are sufficiently large numbers of people unable to gain access to services which have been proved fundamentally important should steps be taken to redress the situation.

Universal availability of broadband services to every home regardless of likely use would cost a great deal. It is most unlikely to be justifiable in the foreseeable future, as it would require massive cross subsidies from other users (or the tax payer). It should however, be possible to make services available to the general public in areas of concentrated use such as libraries and schools. The Government should promote this approach.

If universal service is imposed, the Government should ensure that the service providers are not commercially disadvantaged. Company shareholders should not have to fund exclusively what may amount to social requirements.

Question 5. What is the role of central Government in connection with the "Information Superhighway" service provision, including the following areas: (i) leadership; (ii) promoting inward investment; (iii) promoting and safeguarding the interests of UK firms worldwide; (iv) promoting network compatibility; (v) access to Government information; (vi) security of payment; (vii) data protection, confidentiality and censorship; (viii) verification of information; and (ix) promoting the development of UK-oriented software.

LEADERSHIP

The role of the Government will be crucial in creating a climate of commercial freedom in which services can be developed on the basis of entrepreneurial initiative.

In particular the Government should:

- provide the correct regulatory structure
    - a light hand on regulation with the emphasis on commercial freedom;
    - fair and reasonable terms for interconnection;
    - freedom to use technologies of choice;
    - prices set competitively;
    - financial returns commensurate with investment and risk;
    - the convergence of the many current regulatory agencies;
- stimulate the market through Government funded long term, pre-competitive research and development. The final implementation of particular technologies should be left to commercial decision-making by the market.

- encourage private sector investment, with Government funding aimed at facilitation and promotion of the right environment and ways of living and working. The DTI Information Society Initiative is an encouraging start.
- provide support services such as training, technical expertise and administration for the users and implementers of the new services.

Inward Investment

An open approach to regulation should encourage the development of new services and thus inward investment. However, this inward investment should not be favoured or subsidised at the expense of established UK businesses. Government should exploit its power to ensure reciprocal market openings for UK companies overseas. In general a company established and owned in the UK provides greater benefits to the UK economy than those controlled from overseas.

UK Global Interests

The Information Society involves global markets in which, thanks largely to the benefits of liberalisation, the UK has some particular strengths. Global competition on a truly level playing field will be vital. Communication services liberalisation must become a reality in the EU in 1998 and apply to all players, not just telecoms. Reciprocity in the opening and development of markets should be a key factor in international negotiations.

We must accelerate the rate of development if we are to stay abreast of other regions. A clear vision of what can and should be achieved by the UK over the next decade should be developed and facilitated, but not directed, by the Government.

Rigorous implementation and enforcement of EU and worldwide open markets will be required. This is an area for energetic and forceful action by the UK Government.

Network Compatibility

Standardisation and compatibility issues are being addressed in many national and international fora. The Government and regulators should encourage support of these bodies and concentrate on encouraging open interfaces across commercial domains and in particular to information content.

Access to Government Information

Special emphasis should be placed on the Government as a user—bringing the superhighway directly into millions of people's lives—in areas such as health, education and social services. The Government's expertise makes it uniquely well placed to stimulate specific sectors of the economy and move the superhighway from concept to reality with knock-on effects elsewhere.

We recommend a concerted search for government applications that could be put out to open tender. Government funding of these applications would encourage the rapid development of the supplier community which could offset development costs for later customers.

Security of Payment and Verification of Information

These issues must be agreed in principle at international level and detailed implementation driven largely by commercial fora. There may be failures but the winning payment systems are likely to be more efficient and robust. A system of key depositories and public key certification may be needed.

Data Protection, Confidentiality and Censorship

Intellectual property rights, copyright and data protection laws must all be kept or brought up to date, but not reinvented for particular services and technologies that are constantly changing. Censorship, for the protection of minors for instance, tend to vary in scope and application from nation to nation—a distinction which the superhighway ignores. This has given cause for concern. There is a trend towards "self censorship", where service providers enable users to control or block access to particular services. This is eminently more practical than any Government attempts to impose detailed controls. These matters should be the responsibility of service providers rather than network operators.

PROMOTION OF UK SOFTWARE

The UK leads in the development of software for many multimedia applications. The early growth of the superhighway in the UK and abroad would help to sustain and develop this lead. Specifically, the Government should be an early adopter of multimedia services in the public sector and promote the international adoption of application standards compatible with UK developments.

Question 6 What is the role of local and regional government in connection with the "Information Superhighway"? How can new services be used to boost (a) the ongoing regeneration of urban areas, (b) other local economies?

. Local and regional government must become part of the information society. They should promote its use in schools and colleges to familiarise younger people with the new technologies and provide re-training facilities for others wishing to enhance their skills. Local government should provide access to local information so ensuring better-informed citizens and enhanced local communications. There will be many opportunities for new services in the local community, such as links between doctor's surgeries and regional hospitals, and within the social services area to provide better contact with people with disabilities.

The new services will play a large part in transforming local economies as we move from an industrial to an information age. A new information-based sector will emerge, unrestricted by geographical boundaries. This sector could be based anywhere. We could see the birth of "virtual enterprise parks" in close commercial contact and with a rapid exchange of value added services, but physically distributed across those parts of the globe having access to the superhighway. There will be less need to group together in industrial parks or conurbations or to relocate following a change in working environment or employer. People will work from where they are already based, or from where they wish to be.

Question 7 What will be the impact of the "Information Superhighway" on working practices and employment prospects?

The information superhighway will bring about profound developments in our society. It will affect the leisure activities and working patterns of all UK citizens, create opportunities for education and training (for those at school and beyond), and offer new prospects for inner cities and remote rural areas. Certainly, working practices will be impacted through the direct use of the new technology, in particular though better access to information and through the ability of individuals to have more control of their local environment.

WORKING PRACTICES

- Education and training facilities will be revolutionised through improved access to limited resources, such as experts, computing facilities, and multimedia information. The distinction between formal training and on the job information will largely disappear, leading to a system of "lifetime learning" for all.
- Direct advantages to businesses include more efficiency through the use of "virtual" meetings. Better decision-making through enhanced information services, will reduce cost and time for new products to get to market.
- Travel both for personal and business purposes could be reduced. Even a modest amount of teleworking could result in some £2 billion per annum savings in the transport sector.
- People will find it easier to work away from their offices, as they will have access to the facilities and information they require.
- A greater exposure to international influences would result in people being more commercially aware and better able to meet competitive demands.
- Overall, people could have more choice in where they work and for whom.

EMPLOYMENT PROSPECTS

Employment prospects will also be heightened through the creation of a new service sector, through the additional infrastructure construction required, and through the ability of previously inaccessible people to participate.

- The information superstructure will reshape relationships within and between businesses, improving local efficiencies and the efficiency of the national business base, and so creating favourable conditions for increased employment.
- UK businesses will be more competitive through lower costs and increased efficiency. Productivity gains of up to 5 per cent can be achieved through the introduction of broadband technology.

- Multinational corporations already attracted by the sophistication of Britain's leading telecommunications infrastructure which also gives European and global access, will be further encouraged to base European operations here. BT's world leading advanced global networks have a major part to play.
- The manufacturing base within the supply industry will be increased since it would be well positioned to tender for supply within the UK and in export markets.
- The service sector for the provision of Information Technology services will be enhanced, and a substantial new industry in this area could be created. This would include both service provision and content creation sectors.
- Leading edge R&D capability will be created in multimedia, broadband and opto-electronic technologies, which could replace the traditional stimulus from the UK defence sector.
- An increased capital investment programme would create employment by direct stimulation of the economy. The UK telecommunication supply industry has already shown itself to be internationally very competitive in this area with the encouraging development of small start-up companies.
- Employment prospects for groups such as people with disabilities would be very much enhanced. Greater access to information for those currently least able to access it will be possible and the barriers of discrimination will be reduced. Those physically unable to get to an office, for example, can work at home.

Extrapolating forecasts for the US would suggest that UK GDP can be enhanced by up to £12 billion over a 12 year period, provided that Government removes the regulatory inhibitions on investment, and encourages users to adopt broadband technology.

This extensive range of benefits has now prompted international awareness of the potential value of information networks. Any nation that invested in such a network would see benefits. However, we would expect that there would be considerable disadvantages to those that committed late: lost opportunities in establishing a manufacturing base; a worsening in balance of payments through technology imports; a reduction in size of the service sector involved in information provision; and a reduction in overall GDP as large multinational companies locate in countries with a superior infrastructure and expertise.

Question 8. Is the dominance of mass-market US software a threat or an opportunity? What hard commercial initiatives can be made (as opposed to "collaborative" ventures such as RACE or ESPRIT) to respond to this dominance?

Software is taken to mean information content such as films and books as well as applications that run on computers.

Information Content Software

Open access to the global information superhighway will increase greatly the information from overseas (eg US films and TV programmes) readily available within the UK. Rather than the imposition of quotas or restrictions on overseas material, however, UK content creators should be encouraged to exploit their skills and make full use of the opportunities arising in the UK and overseas to deliver their material.

Application Software

The relationship between the Microsoft Network and the core Microsoft Windows products is a major concern. Microsoft appear to want to exploit their dominance. Regulators within the USA are paying attention to this potential abuse and the UK Office of Fair Trading (OFT) should do so as well.

There is little reason why UK companies should not emerge as market leaders in the area of Internet software, if they have a world-class product. The Internet removes geographical boundaries and the US becomes an easily accessible market from the UK. The area is therefore a huge opportunity if we make an early entry, or a threat if we are late.

Hard commercial initiatives can only spring from true competitive advantage. BT itself has a number of initiatives which it will seek to develop worldwide. The Government can encourage such initiatives, and work with our global trading partners to ensure that the equivalent of Fair Trading rules are strictly applied.

Annex A

Current Form of the Information Superhighway

The technologies that underpin current forms of the superhighway fall into four categories: transmission, switching, data storage and bandwidth compression. As well as these elements the information superhighway would also include network control and billing systems.

1 TRANSMISSION

Optical Fibre—used in networks between switches, and increasingly to connect the exchange to the home or business premises.

Coaxial Cable—made from copper and laid out typically as tree and branch systems sometimes used for cable TV networks.

Copper pairs with Digital Subscriber Loop (DSL) technologies—copper pairs normally carrying analogue telephony can be upgraded to carry broadband digital signals at ranges up to 5000m.

Hybrid Systems—usually consisting of optical fibre to the street and a different technology for the final connection. This final connection may be high speed copper pairs, coaxial cable or radio.

Satellite—already extensively used for broadcast TV, and for direct connection into business premises.

Terrestrial Radio—used for broadcast radio and TV, but also as applied to cellular and PCN systems for two-way telephony.

2 SWITCHING

Circuit Switching—used in most telephone exchanges for interconnecting telephony channels.

Packet Switching—in which the data are parcelled up into "packets" of information carrying a "forwarding address". Packet switching is used in many technologies such as frame relay and ATM, as well as routers which are used extensively within the Internet.

3 DATA STORAGE

Advances in integrated circuit technology mean that large amounts of information can be readily stored in digital format. "Video-servers" are now being developed by major software and computer companies.

4 BANDWIDTH COMPRESSION

Bandwidth compression techniques continue to improve. For example, a good quality video picture that previously needed to be encoded at 140 Mbit/s can now be compressed to 2 Mbit/s making its delivery a much more economic proposition. Standards have already been formulated for such compression technology eg Motion Picture Experts Group (MPEG).

Combinations of these elements together make up the various physical networks that exist in the UK, although the complete entity would also include network control and billing systems.

March 1996

Examination of witnesses

DR A W RUDGE, Deputy Chief Executive, MR J BUTLER, Director, Regulatory Affairs, and MR R GAVIN, Director, Multimedia Services, British Telecommunications plc, called in and examined.

Chairman

501. Good morning, Dr Rudge, thank you very much for coming. Would you like to begin by introducing yourself and your colleagues and then making any sort of preliminary statement that you think would be most helpful to us?

(*Dr Rudge*) Thank you very much. Thank you for the invitation to come here today. First of all, on my right is Rupert Gavin, whom some of you have met, he is in BT the Director responsible for our multimedia service provision activities. John Butler, on my left, is a Director of our Regulatory Affairs activity and he is an expert in the regulatory areas of BT. Behind me I have my colleague, Dr Rowbotham, Director of Technology Strategy, and some other colleagues who will provide support to us if your questions demand it. Thank you for the opportunity to say a few words in advance. I would like to start by stating perhaps the obvious: that BT is a major United Kingdom company and it is operating in what is the most open telecommunications market in the world. We have currently 150 licensed operators to compete against so we are not short of competition. We do believe in fair competition and competition has helped to shape the BT of today.

Chairman *contd.*]

There is no doubt that most of my colleagues could give plenty of examples from their experience to back that statement. Since privatisation in 1984 we have invested some £30 billion, mainly in the United Kingdom and mainly with United Kingdom suppliers. We continue to invest at a rate of about £2 billion to £3 billion annually in this area. We are investing heavily in the development of new multimedia services, things like the BT Interactive Series Trial and CampusWorld and a range of other multimedia services and this is despite the regulatory uncertainty that certainly hedges us. These investments are very large and they are funded from the profits of today's mature products. I would like to emphasise the point that telephony is today's mature product in a multimedia world. Let me say a little about BT's R&D services. Our R&D and technical services budget amounts to some £500 million per annum and that is focused on the BT labs at Martlesham and in five other centres around the United Kingdom. But also we spend significantly with the universities and colleges in the United Kingdom as part of our portfolio of activities in research and development. This work includes fundamental research into new applications and in research into the impact of the new superhighway services, which also concern us. We believe very strongly that the superhighway will be key to economic development in the United Kingdom during the next decade—really key. Its real value lies in the huge IT industry which is going to be stimulated by the availability of the underlying broadband networks. Not just the networks in themselves but the whole plethora of activity which sits on and around this network activity. All of this industry is going to be engaged in the development, provision and support of new products and services, only some of which we are aware of today. The superhighway itself is a digital broadband switched network and as such, in our opinion, it does not exist anywhere in the world on a scale where it is accessible to a major part of the population in the area. There are trials and pilots and various bits and pieces but there is no ubiquitous superhighway active today. We think it is vital that the Government does everything possible to create an environment which promotes the development of the superhighway and its applications in the United Kingdom. We believe that all companies should be encouraged to participate, including the national telecoms operators, and that the regulatory conditions should not discourage companies such as BT because we believe that we have a great deal to contribute in this new area. I think that is all I would like to say by way of opening.

Chairman] Thank you very much.

Lord Haskel

502. You said, Dr Rudge, that you think the Government should do everything possible to see that there is the creation of an information superhighway. What is it that the Government can do that you and the 150 other operators you mentioned cannot do to create a national information infrastructure?

(*Dr Rudge*) Let me offer one or two comments. One is that from BT's point of view we are not looking for Government money in this area. What we are looking for is an open playing field that allows us to attack this market, and indeed stimulate it, because largely it does not exist as yet. We are actually growing it, and need to do this without unnecessary constraints. By "unnecessary" I mean regulatory constraints that prevent us from using certain technologies in certain areas, and which constrain us from developing new services by guidelines which were maybe sensible when they were introduced but no longer have much meaning in a very fluid and changing new environment. The IT environment is one that is changing almost on a daily basis. It is very difficult to take rules of ten years ago and apply them today sensibly. We are looking for some removal of these unnecessary hurdles. The Government can do the things it already does to a degree, for example, encouraging research and development. Indeed funding some of that research and development as it does through its various agencies, and ensuring that some of that is directed at this new area which is of critical importance. I think in relation to the key issue I could express the regulatory guidelines differently. What we are really looking for is to construct a marketplace, or a market structure, which allows us to be unfettered to the degree that we can be unfettered. We fully appreciate that some regulation is required.

503. The problem, of course, is that you are so overwhelmingly large in the marketplace that the other smaller companies without some sort of regulation would not be able to operate or would not be able to compete. How would you deal with that?

(*Dr Rudge*) We are a large company. You said we are large in this marketplace but in fact we are not dominant in this marketplace, because the marketplace itself in terms of new applications and new services is not one that is only addressed by telecommunication operators. It is being addressed by the whole of the IT industry.

Lord Flowers

504. And all over the world you could add.

(*Dr Rudge*) And internationally, yes. We are just one player, one national player in this case as far as the United Kingdom is concerned. We are only one and there are many, other players. Indeed today when we look at where our competition is coming from in these new market areas, first of all we certainly look internationally and, secondly, we do not just look at telecommunications operators but at everybody in the IT industry from the computer industry right through, because competition comes from many different directions today.

Lord Gregson

505. Since constraints were placed on BT we are now facing a digital transformation which makes an enormous difference. The constraints that were applied to you were applied in the days when nobody thought that this stage would arrive. Would you like to tell us where the constraints pinch? It is terribly

Lord Gregson *contd.*]

important to understand the constrictions that you are working under. I still do not have a clear picture.

(*Dr Rudge*) I think the constraints pinch in a number of ways but let me describe one which affects the network itself, the asymmetry constraint. We are looking at a new market which does not yet exist. It has only been over the last three or four years in particular when we have decided that our policy has to be to develop the market as well as develop the network capability. Because we can only justify the network investment based on the existence of an active multimedia market environment and that is not yet there. In examining the emerging marketplace, and considering how to address it, we have to look at all of the elements that exist at the moment. One of the most obvious targets has been the broadcast tv entertainment market. When you look at the prospect of moving into interactive services, which is the services we are particularly interested in, and you are addressing customers needs, you find that probably the best package to attract them is a mixture of services. It involves some broadcast content, with the ability to switch into interactive services, and these two things have to be integrated. Digital technology gives you the opportunity to do it technically but the regulatory environment would not allow us to provide it today as a package of services. We would be able to do the interactive bit but not the broadcast. This is a definite disadvantage when you are trying to put together a business plan which justifies an investment against a very risky non-existent market at the moment. So after taking all the risks into account and being constrained into only providing a part-service the sums do not add up very well. That is one example of regulatory constraint. I will give you another one and that is at the moment BT is under review in terms of its price cap. You can look at the profits on today's mature telephony product and say "those are high profits therefore we ought to squeeze them down and put a large price cap on BT." But it is these profits that are funding the more risky developments in multimedia services. The future is being funded on the basis of today's mature product. That would be true in any company, it is just that it is a large scale example in the case of the telecoms business. I think that has to be borne in mind when those price caps and other regulatory constraints are considered. I can give you a third example and that is we are constrained at the moment in the use of radio technology. There are many applications where we would want to get telephony and multimedia services to a diverse and well distributed population where the economic way of starting would certainly be to use radio technology. For some considerable time we have been battling over access to some spectrum to do this. This is another example of regulatory constraint. I do not blame it all on the regulator incidently, I am just saying that the environment is changing so rapidly that you cannot put regulatory pegs in the ground and leave them there for ten years and believe that you are doing the sensible thing.

506. But one other aspect of this that worries me is that you are the only organisation in the United Kingdom that has got the switching capacity to deal with things like interactive television or interactive services. Would it not be an enormous waste to duplicate your switching capacity just to provide competition in certain areas? This worries me.

(*Dr Rudge*) I think this is rather a deep question and perhaps it is not one on which BT's view would be well respected because self-interest would be seen to be too strong. That is a judgment you have to make. We have a huge investment not only in switching but in the local access network and to duplicate that totally in the interests of competition with something which is virtually the same technology is questionable. I think I will leave it there.

Lord Butterworth

507. From what you have said I think there is an implication, is there not, that the regulations are adequate to deal with a national competitive situation but you have described a market which is international? Is it possible for a national regulator successfully to operate in an international field? Do you see in the future regulations still being nationally organised? To what extent would you regard the European Union as having a part to play in regulation?

(*Dr Rudge*) Perhaps I could ask John Butler to say a few words on that.

(*Mr Butler*) I think it is probably best to think of regulation at three levels. First of all there is the discussions that are going on in the World Trade Organisation at the moment looking at multilateral liberalisation of telecommunications. When you are thinking about liberalisation of telecommunications regulation goes with it, because no market in the world is fully liberalised, it is always regulated. So one of the key issues in the WTO negotiations, which are due to finish at the end of this month, is the regulatory conditions that countries subscribing to WTO will adopt. If those negotiations go successfully we may well have an overall view of what the regulatory regime ought to be on a worldwide basis, at least in those countries that have subscribed to the WTO process.

508. The body that you mention has the authority to apply regulations worldwide?

(*Mr Butler*) Correct. Assuming that the countries concerned have joined that body, yes. In the case of the European Union, the European Union is the body that negotiates with the WTO on behalf of Europe. Offers have been made to the WTO by the European Union on the scope of regulations in the future based upon the package that has been put together by the EU for the liberalisation of European telecommunications from 1 January 1998. A similar offer has been made by the Americans and we are hoping that the Japanese and others will make offers too. The European Union, therefore, will also legislate for telecommunications regulation but that legislation will probably be fairly vague in the way that it is written and provide a degree of scope for national regulators to interpret that legislation in different ways. The framework will be set at the European Union level but individual national regulatory agencies, such as Oftel, will interpret it in each country. We have a concern that that may lead

Lord Butterworth *contd.*]

to 15 different regulatory regimes throughout Europe as each one interprets it slightly differently.

(*Dr Rudge*) I would just like to add one more point if I may and that is that we are going through a liberalisation transition, if I can describe it like that, not only in Europe but generally around the world. During this period we must have regulation and there is a need to strike a balance between local competition, to make sure that there is local competition and it is effective, and national competitiveness in that we are competing against big players from other countries who are just as determined to establish themselves in these markets. Keeping an eye on that balance is not something for the regulator because he has a national remit, it is something for, in our case, the DTI or Government to ensure that the balance is a sensible one.

Baroness Hogg

509. Dr Rudge, if I could make another attempt at categorising those three areas where you find regulation pressing that you talked about earlier. One point was the impact of the price cap. Perhaps I can put that one on the side for the moment, that is part of the ongoing nature of life in BT in a not fully competitive environment with a regulator. You then identified, as it were, two other categories. Without wishing to lead you anywhere I wonder if you see a distinction between them in terms of the pressure. One is, as it were, the erection of a number of no entry signs, that you may not use this kind of technology or be involved in this kind of activity, where the debate must be about the extent to which you need to be held up to allow others to grow, and you could argue that is inhibiting you from growing internationally. The third set, however, was a set of regulatory restrictions which are at least designed to grow the market in ways that I know you share the ambition to grow, that is to make service providers feel that they can provide products in confidence that they will have non-discriminatory access to BT networks. Would you make that distinction that I have made between those last two categories? Which at the moment would you see as the most—I do not want to use as loaded a word as unfair—unjustified?

(*Dr Rudge*) Let me pick up one point at least. I will not cover all the points that you have made. You mentioned the service provider and the network operator issue. We very much believe in that distinction. There are service providers and there are network operators. We, incidentally, have business interests in both but we do not see ourselves as a uniquely vertically integrated structure. Indeed, there is a very good reason why we should not see ourselves as a vertically integrated structure and that is the only way we can really justify our network investments in the future is if there are many thousands of service providers that want to use our network. I think the best mental analogy for the network is that of a giant computer. If we build a giant computer we desperately need people to provide applications and bring their applications to run on the machine or it is not going to be exercised sufficiently to make the original investment worthwhile.

510. Although you might disagree with the detail of regulation the principle of regulation designed to reassure service providers that they will have access to networks is not a problem to you?

(*Dr Rudge*) Not at all. Indeed I think you will find that many of these concepts of service provision network actually originated with us and we actually presented these to the regulator.

(*Mr Gavin*) As a service provider we obviously operate at arms' length from network provision. The purpose that we see in BT acting as a service provider is in part to stimulate the area, to show what is possible by putting investment into the service provider business quite separate from the network business. Too often one thinks of the network business as the primary area of risk but I would underline that establishing these services is also a critical area of risk. BT can play an important role in stimulating this area of business, because if it is not present then one key important link to the chain is not in place. BT as a service provider must operate at a discreet distance from a network operation business, the network operation business must see a whole plethora of service providers being capable on equal terms of coming to the network business. Speaking from the service provider perspective, the most important priority is ensuring that the network part of the business has the necessary incentives to be able to build the network capability to be able to deliver the services that we are imaginatively creating and to create the conditions in which the network business will be willing to take those sorts of risks to move into a market that does not today exist: therefore nobody can be considered to be dominant. What does require a degree of clarity are what the regulatory conditions will be, and a degree of clarity that the investments being made in high risk network capability will carry commensurate rewards if successful.

511. So am I right in my inference from Dr Rudge's earlier run through of the regulatory problems that the main focus of your anxiety, although not the only anxiety, is those no entry signs?

(*Dr Rudge*) There are a number of regulatory issues that I touched on and you might describe them as no entry signs. Certainly those are a problem, the areas where we are not allowed to tread for whatever reasons. The vision one had a decade ago of the way telecommunications was moving and the vision today is completely different and it has to continue to change rather rapidly, it is a very fluid environment. So many of the pegs that were put in the ground a little while ago may have been very sensible when they were knocked in but they do not look very sensible today if you look at the way things are developing. Some of those no entry signs definitely slow you down if they do not stop you entirely. They do not always stop you but they do slow you down and the trouble is we are in an international competition and slowing us down is tantamount to death really, you cannot be slow in this game. When I go to talk to some of our suppliers, and some of them are suppliers who manufacture their equipment here but they are international companies, and I say: "The rules in the United Kingdom are that BT is going to be kept out of this area to see if a couple of

Baroness Hogg *contd.*]

little companies can get off the ground in the next five years", they look at me with astonishment. That is in effect what you get -the big player slowed down to allow one or two small companies to see if they can make it. That is a bad principle even though I fully accept there needs to be a basis upon which small companies can get off the ground. Fortunately in the service provider world it is in our interest to get small companies off the ground, we have actually got to encourage them by example, by help, by doing everything possible to get service providers up and running because without them our network investment is wasted.

Lord Flowers

512. Could I just interrupt a second. I wonder whether you could be specific about what changes you would like to see in the regulatory framework?

(*Dr Rudge*) I can be specific about some of the issues, they are rather complex some of them and they would be best addressed by note rather than verbally. We have had the discussion over the asymmetry issue many times and I think a mistake was made the last time it was renewed. The House of Commons' Select Committee did make a recommendation which was not ideal from our point of view but we thought was practical and it suggested a progressive removal of this barrier over a period. The idea to give cable companies at least seven years start in this area. We and the cable companies welcomed that report when it was made but it was not acted upon. I think that was unfortunate because it was an example of where some regulatory barriers could have been moved away to allow players like us to address the whole market and not parts of it. There are other constraints particularly if you look at the area of fixed/mobile conversion, where mobile services and fixed network services are beginning to evolve together rather than as separate services. The customer does not really want to know who is handling the traffic, he wants a service which may involve both mobile and fixed networks. We have wanted to take control of Cellnet, a company we own 60 per cent of, but we cannot do that. There are many examples that I could give of specific pieces of regulatory activity that prevent us pursuing what I would consider to be the normal course of business.

Lord Gregson

513. I had not realised that you were fundamentally constrained on the radio system. Take me as an example, I shall never get cable because I am right at the top of a long hill. I have a colleague who is in the same situation. I cannot get satellite unless I build a huge mast myself because the hill is in the way because I live in a valley. I can see the television aerial, the television repeater, I can see your blasted Cellnet transmitter on another hill some distance away but I shall never get any useful services out of that lot in effect. You would not be allowed to use either of those services to assist me, would you?

(*Dr Rudge*) Let me ask John Butler to expand upon it. The fact is we have had a long, long battle over this question of what we call'radio tails'. That is, being able to use radio at the fringe of the network to reach out. We have had some easement, not total but some easement, recently.

(*Mr Butler*) The answer depends upon where you live. If you live in Wales then the answer is probably yes and if you live in England the answer is probably no. We are about to be given radio licences for telephony provision in a very great proportion of the country covering a very small proportion of the population. In broad terms the radio licences cover most of Scotland, most of Wales and most of Northern Ireland but not very much of England.

514. I live in the Pennines so that is out I presume.

(*Dr Rudge*) Yes, you are out.

(*Mr Butler*) Those are for telephony applications, not broadband applications. They will be of use in reducing the cost of providing a universal service in those areas but will not be of great use in providing the sort of broadband digital services that we are talking about in connection with the information society.

(*Dr Rudge*) This is an example of using technology constraints, in this case it is a sort of geographic technology constraint, that makes our business quite difficult in terms of justifying the use of these technologies on a national basis.

Lord Craig of Radley

515. The BBC earlier suggested to us that especially as digital terrestrial transmissions will replace analogue householders will choose a single delivery system for all services and they quoted, for example, a reduction in television aerials in Germany. That is a bit premature but nevertheless I will be interested in your views and comments about the concept that householders will wish to constrain themselves to a single path for all the various digital media, including telecoms, that could be made available to them.

(*Dr Rudge*) I do not think every customer will prefer one path but I do think customers, by and large, prefer to have integrated service provision and not to get a bit from here and a bit from there and have to deal with maybe half a dozen different suppliers for different elements of the service that they want, even if you can provide it across half a dozen suppliers. Certainly these different delivery media that you are referring to will be competitive. They will not be competitive as technical means of delivery, but in terms of the service package they offer the customer and the price they offer it at. At different times and in different locations different delivery mechanisms will have advantages and therefore the package will have an advantage. Our problem is that because of the various constraints our package starts to become a very funny shape, or we go to all sorts of devious lengths to try to get round the situation where, for example, we cannot deliver by radio in the Pennines although we can do it somewhere else. Then we have to think of some way of getting round these objections. It leads the development to be slower because you have got to find a solution and it also makes it more expensive because you cannot solve it universally. Sometimes it means we cannot do it at all for a while and have to delay. So quite frankly we are

Lord Craig of Radley *contd.*]

looking at the problem of how do we get a combination of multimedia broadcast and interactive services to our customers in the United Kingdom. How are we going to deliver them? What have we got to do to deliver them? We are thinking our way through all sorts of scenarios and trying to make deals and arrangements to achieve this end. If this regulation did not exist there would be an obvious way for us to do it and that would be to build the network in a certain way.

516. So you feel that there is a strong constraint because of that particular area of regulation which at the present time is limiting your ways of doing things? Viewed from the customer's point of view it seems to me that that regulation is also a handicap. If the customer can get what he wants through one channel, although it may be multimedia, it may be interactive, that clearly is an advantage I would have thought for the customer.

(*Dr Rudge*) I certainly think the nature of these regulations and the constraints do not serve the customer well. It creates monopolies, which we are trying to avoid, by only one type of company being able to provide a range of services. So you do away with the competition, which is also in the customer's interest, and you prevent powerful players like BT from getting into doing things which I believe would be in the general interest of customers in the United Kingdom, be they business or residential customers.

Chairman

517. Do these sorts of limitations limit your ability to compete in operations abroad or in fact are you able to deal with partner companies abroad and get this sort of experience on which you can draw?

(*Dr Rudge*) We have set ourselves a vision and a mission to be the most successful telecommunications company in the world, which is no mean challenge I might tell you. With most of the partners we have worked with we certainly contribute a leading position in these new services. We have, as you will know, an alliance in the United States where we have a partner and certainly MCI brings something to the party. Some of our other partners are fresh-starts, new competitive allainces in Europe for example, and it will be mostly from us to them in terms of technical flow. We cannot really operate around the world and hope that our partners will do it for us. In any case if we cannot apply it here then it would not be beneficial to us. Certainly we want to see ourselves as leaders in this field. We will not be the leader in every new service, quite clearly, but we want to see ourselves well up at the forefront being able to provide first rate world class network services in the United Kingdom and anywhere else we choose to operate.

518. Could we go on to your recently publicised interest in Intranets. Tell us something about that.

(*Dr Rudge*) If I can just say about Internet and Intranet, the Internet is, in my view the "ham radio of the information age". I do not mean that in a disrespectful way because it is generating a lot of excellent technology, good ideas, new services and so on. Intranet is concerned with providing services in a more professional way and to relatively closed user groups. Even though those groups may be large we use the technology of the Internet to provide information services on a closed user basis. Rupert can give some examples of us supplying Internet access or the Intranet approach to services.

(*Mr Gavin*) We view the Internet and the Intranet as being the key growth area, primarily in what we term 'data dial tone'. It gives the customer the capability of connecting anywhere to anywhere on an open standard in the transmission of data in a way that is very comparable to the connection of voice in the traditional telephony model, obviously with some other interesting characteristics in the networks that are necessary for the performance of these. In connection with Intranets, therefore, we see that there is a growing market for individual companies or individual communities of interest to be able to use this form of data dial tone as a basic communication methodology; in that regard there are various activities that we have already embarked on, for example our HealthNet which is an IP based Intranet for all the various bodies within the Health Service. We are also actively exploring the possibility of provisioning a concept called London Link which is an IP network for organisations within London. This was recently announced as a project that ourselves and AT&T would be providing trials of in the coming months. We do see it as a very important growth area primarily geared towards data provision, therefore E-mail, basic communication, file transfer, rather than well geared to the broader multimedia and the video rich entertainment and learning types of services which are also very, very important for the future.

Lord Butterworth

519. You have had, I believe, one or two experiments, have you not, with the networking of schools. Could you tell us about that?

(*Dr Rudge*) We have a number of school experiments using the Intranet, and by that I particularly mean the kind of data transfer that Rupert was referring to, that is what we call 'medium band', or 'ISDN type' speeds, not broadband multimedia speeds of transmission. At the same time we are also doing our interactive services trial in Ipswich which also goes out to schools. That is a multimedia trial and it includes full video capability, interactive video. I do not know if you want to say a few words about the specific trials, Rupert?

(*Mr Gavin*) The specific services that we are currently providing in the education field include CampusWorld which is an Internet based content service. This is the concept of a walled garden with currently about 18,000 pages of information that schools, both pupils and teachers, can access in a closed environment. CampusVision is the communication using ISDN telephony to enhance remote learning, particularly in areas of the country where teacher provision in certain subjects is difficult, therefore the utilisation of ISDN tele-conferencing can enhance the teaching capability. Within Bristol we are providing a trial network called Bristol Education On-Line.

520. Is that Withywood?

Lord Butterworth *contd.*]

(*Mr Gavin*) Yes. This has a broader band capability which is combining CampusWorld, CampusVision and also the downloading of educational CD Roms from a remote server site to a range of schools so that pupils can now have on-line access to CD Rom material. We are very active in designing and testing these types of services. In relation to CampusWorld this is now a national service with several thousand schools already members of CampusWorld.

521. To what extent have these experiments caused you to be involved in the teaching of core subjects, the teaching of subjects in the National Curriculum?

(*Mr Gavin*) Very involved in terms of providing material to support the National Curriculum. This obviously involves us having key expert groups skilled in the National Curriculum advising us and in many cases supplying to us the relevant content that is appropriate for National Curriculum studies. We do develop these content based services very closely in line with National Curriculum requirements. They are meant to be an aid to the teacher in the real curriculum based teaching environment.

522. The materials do exist, do they, in history or mathematics or physics?

(*Mr Gavin*) Some exist, some we have to commission the creation of. Out of the 18,000 pages, for example, that we carry within CampusWorld a sizeable proportion we have specifically commissioned from teachers, academicians and authors who have created in response to the express needs of our expert teacher user groups.

(*Dr Rudge*) CampusWorld is not a trial, by the way, but a service that we offer. There are over 2,000 schools signed up now and we hope to get 8,000 on the service by the end of MArch 1997. Some of the others are trials.

Lord Flowers

523. What routine use do they make of the services that you provide?

(*Mr Gavin*) To give you an idea, out of about 2,000 or so schools we are currently receiving something around 70,000 accesses per teaching day to the service which starts to tell us from the regularity of pattern that these schools are actually using this, primarily during the day but we do notice a certain level of usage off hours and during holiday periods which clearly relates to teachers using this as part of their preparation to assist them.

Lord Haskel

524. I just wanted to ask how you charge for CampusWorld?

(*Mr Gavin*) In a couple of ways. We offer the customer the possibility of merely having access to the walled garden itself where the charge is on a monthly basis of approximately £12 per month per school, or alternatively they can choose to have access to the broader Internet as well where there is a monthly total charge of approximately £22 per month to provide the walled garden but also the capability of seeking out other educational related material on the broader Internet.

(*Dr Rudge*) The telephone charges are in addition to that! I would not want to mislead you.

(*Mr Gavin*) But all at local rate.

Baroness Hogg

525. Just one small supplementary on that and then I would like to come back after that to HealthNet. To give us some idea of the scale, how would the use of CampusWorld compare with the use of Encarta?

(*Mr Gavin*) In today's terms, since CampusWorld has only been going for six months, I would anticipate in relation to the number of Encarta copies sold that we are at a lower level of use. I do not specifically have those figures to hand.

526. Could I take you then to HealthNet. We had some evidence from the Department of Health on the NHS Net. These terms seem to overlap a little. The description we were given there was of a number of network providers being engaged in this exercise and indeed it being important that a number of network providers are engaged in that their ability to negotiate on price and secure keen prices for GP fundholders in particular or others at below hospital level who are engaged in networks was very important. Would you care to comment? You described it as your HealthNet.

(*Mr Gavin*) This is our particular HealthNet. I was not intending to imply that other people would not likely compete and establish their particular comparable services. It is a service where we have taken the financial risk in establishing this network capability and are now actively offering it to hospital trusts, to GPs and to other entities within the health community. We think in terms of the rates that are charged, in terms of the features, in terms of the fire wall, security and protection, it is a very competitive offering. That is not to say that other companies cannot make the same commercial decisions to offer a comparable network to compete with us. We have built the network structure and it is up to us to market that network structure specifically into the health community in as far as various customers are willing to take those connections.

527. What share of the market do you feel you have today or is the market still too infant?

(*Mr Gavin*) The market is very infant. The market share will be very misleading. The bigger consideration in fact is that the number of organisations currently using such activity is very, very small but we believe will grow very substantially.

Lord Flowers

528. The doctors make an enormous fuss about the importance of confidentiality of medical information, patient records and so on, whether it is justified or not I am somewhat doubtful but anyway they make a great fuss, so you have to provide it?

(*Mr Gavin*) Yes.

529. The question is what is the additional cost of providing security to the standard that they require?

Lord Flowers *contd.*]

(*Mr Gavin*) I would have to provide specific information for you in answer to that. Obviously it is not without cost. We believe that we are providing a level of fire wall and security which fully meets the doctors' concerns but if you would like a specific briefing on some of the costs I can do that.

530. I think it would be helpful.

(*Dr Rudge*) Let me make a point about encryption because that is really where we are going. Encryption is now becoming available at very low cost, it is no longer the significant barrier that it might have been at one time. I do not exactly know what the numbers are but we will provide them if there is an element of that charge that is due to encryption. In fact, it is because encryption is provided through electronics technology, through silicon chips, that it can be provided today at a very much lower cost than in the past. The problem of encryption, certainly at the level which would satisfy a GP, is not a problem, remembering that these are Intranet and not Internet services.

Lord Craig of Radley

531. The HealthNet programme, CampusWorld and so on are clearly very interesting developments in which you have taken a significant lead. Are there regulatory problems which affect what you are doing in those areas in which you would like to see changes made to those regulations? In other words, are there barriers there in the regulatory regime?

(*Mr Butler*) I think perhaps I should emphasise that all of our efforts in service provision in these areas are paid for at full price. The sort of thing that Rupert Gavin runs pays full price to the BT network, the full retail price, less any discounts that may be applicable. Oftel are consulting at the moment on a specific service provision regime which would allow us to charge lower prices to service providers, always assuming that we charge the same price for the same type of thing to all equally, but would allow us to charge lower prices for service provision and that would encourage a greater provision of service over BT's network. The difficulty with that is if those prices are too low then they discourage others from investing in alternative infrastructure and that is the dilemma that is currently being worked on within Oftel as to the extent to which that can be allowed. Although at the moment there are a number of very useful things going on that market could be further stimulated if there was greater pricing flexibility in the way that BT was allowed to charge itself and others for the provision of service.

(*Dr Rudge*) Within BT, to model the emerging external market, or at least as we see it emerging, we have set up our multimedia Service Provision activities, as a separate business within the business. We refer to it as our internal market. Part of the reason is anticipating these regulatory barriers to allow Rupert, for example, to run his Service Provision business, buying from the network against the same rules that other service providers will be facing.

Chairman

532. In the remarkable convergence of technologies that we see there has been, for example, a recent news item about the general provision of digital satellite television to schools. How do you see that sort of development impinging upon your interest in schools?

(*Dr Rudge*) Digital satellite is another means of delivery and as such it is a technology that we examine and consider. It is a little bit like the constant reference to cabling schools. It is not the cabling or the satellite delivery, it is actually the content that is rather important. We look at those two things quite separately. We are covering the ground thoroughly in terms of all the delivery mechanisms and we hope in due course that we will not be excluded from using specific examples. In terms of the content that may go over such links, that is a service provision business and we look at that separately. The constraint of a satellite delivery is, with digital satellite, while you can have up to 200 channels it is a one-way system. Therefore it has to be combined with something else to provide interactive working and it will always only be broadband in one direction. Having said that, it offers certain capabilities and certainly we are deeply engaged in examining its possibilities.

Lord Gregson

533. I want to stray a little from the line of questioning and ask you this question. Could you tell us what the position is as regards digital satellites at this point in time? I know at least two of them have gone up, neither of them are operating yet. What is the booking on the satellite? Have you got a booking on the satellite? Has the BBC got a booking on the satellite? Could you just give us a rough idea what the position is?

(*Dr Rudge*) The satellites themselves are only a part of the problem. You have the capability with a digital satellite to deliver the material in digital form. Most people are equipped with analogue television sets and therefore the box which has to receive and convert the signals is another element of the cost and that is something which normally the customer is faced with. The cost of providing these boxes becomes a key issue in trying to develop the market because the box itself is relatively expensive at the moment. Until it is available in very large volumes and the cost will then fall. If we are faced with a situation where via digital satellites it is one box and via cable it is another box, and BT is ultimately able to provide these services with yet another box, then the customer is extremely unlikely to be willing to buy. The first point I would make is the box and the standards that are inherent in the box are a key factor in the costings and whether you can afford to subsidise the box. If you want to establish these services you have got to get out to millions of people in fairly short order to make it a viable service and to do that there is a specific box subsidy involved.

(*Mr Gavin*) To specifically answer the point as to capacity, currently as you rightly point out there are only a couple of satellites with digital capability but if you look at the programme of launches over the next few years and then look at the companies that

Lord Gregson *contd.*]

have earmarked and reserved space for the European digital satellite delivery that equates, by my recent computations, to something like 3,500 megabits of capacity that has already been reserved within Europe. That equates to somewhere around 90 individual transponders. Each transponder could have the capability of delivering somewhere between eight and twelve individual channels. Those have all been reserved, primarily by the programme broadcasters such as BSkyB, such as Canal Plus, and Nethold. We ourselves do not currently hold anything more than a minimal position as for end use, although obviously through our shareholding in Eutelsat we do have an interest in the actual infrastructure. What is also not clear, because this market is extremely fluid is whether those people who have thus far declared their hand and made reservations on this particular capacity will end up using it themselves or selling it to somebody else. What is certainly notable is the degree to which although a substantial amount of capacity is actually being delivered over the next five years, as soon as it is created it is tending to be reserved or taken by various European parties.

534. Does the BBC have any reserves?

(*Mr Gavin*) Not to my knowledge.

Chairman

535. I am afraid we are, as usual, running out of time. Can I ask you a nitty gritty question. It has been represented to us that the uptake of Internet, which we agree does not really exist in a highly useful form anywhere in the world, nevertheless has been much promoted in the United States by the provision of access via free local telephone calls. Do you have a view on that?

(*Mr Butler*) The only thing that I could possibly add is that though the telephone calls in some places in the United States, by no means everywhere, are free, the effect of being a service provider in the United States tends to time the usage. There has to be some control over the usage and there has been that effect whereas here it has been the other way around.

(*Dr Rudge*) Can I also make the general point that there is no such thing as a free telephone call! The package in the United States that you pay for on a monthly basis includes unlimited use in a very small area which is defined as your local area, and that is built into the package charge.

Lord Flowers

536. All you need to get on to Internet?

(*Dr Rudge*) Yes.

Baroness Hogg

537. There may be no marginal cost for accessing?

(*Mr Gavin*) As John rightly points out the structure of the charges are therefore somewhat different within the United Kingdom. People have a local call charge but their actual charge for the utilisation of the Internet network structure itself is by and large a single quite competitive sum regardless of use whereas in the United States you will see that the majority of providers charge you for additional hours used so there is a different balance in charging. I think one of the key drivers in the United States of the Internet has been primarily the existence and penetration of significant numbers of personal computers within the home where penetration is approaching somewhere in the 40 to 50 per cent of US homes. I would point to that as probably the more significant enabler in terms of Internet traffic.

Chairman

538. As against that only about a tenth of the people in the United Kingdom who have personal computers at home have modems which provide them with access to the Internet, say. What makes the difference in the States? That is a different figure presumably?

(*Mr Gavin*) It is a different figure which is the penetration of modems within PCs and what has been a slower adoption of advanced features within PCs within the United Kingdom.

Baroness Hogg

539. Does that suggest that the possession of a personal computer is not a strong drive for Internet use?

(*Mr Gavin*) It is one important factor.

(*Dr Rudge*) It is the first step.

Lord Gregson

540. You have a growing field, cutting out the PC of course, at a much lower cost and I cannot see any reason why that should not develop fairly rapidly. I understand that the project costs are around about a dish washing machine equivalent and that makes it about a seventh of the cost.

(*Mr Gavin*) Clearly there are many, many plans being mooted to introduce a far lower cost network terminal.

541. But that is without memory of course?

(*Mr Gavin*) Yes, with less memory, with fewer features.

542. Is there a collective name for that?

(*Mr Gavin*) Dumb terminal has been put forward, or the NC.

Baroness Hogg] It does not sound the greatest marketing name!

Lord Gregson

543. I heard it called the Alzheimer's terminal.

(*Mr Gavin*) Clearly there is a potential market.

(*Dr Rudge*) There is an industry battle taking place from the PC suppliers on the one hand who believe the future lies with the PC and from server providers on the other who believe it would be much better to provide you with a cheap dumb terminal and have the information on a server. I imagine both of these will exist for a considerable period.

Lord Gregson] I find it very significant that Bill Gates is now investing in dumb terminals.

Baroness Hogg

544. With digital televisions you get more intelligent televisions that are almost as dumb as the dumbest of terminals.

(*Mr Gavin*) Exactly. In fact, if you look at the boxes that I referred to that convert the analogue television into a digital television it looks very much like the contents of a computer. That is what it is actually, and computer companies generally make them. Obviously you can see progressively a convergence of sorts between the computer and the television, one having more keys than the other.

545. Your Telcom is either a rather bright television or an extremely dumb computer.

(*Mr Gavin*) Yes.

Chairman

546. I am afraid we shall have to bring this session to a close today. Thank you very much, Dr Rudge and colleagues. If you would like to make one final two sentence statement we would be grateful to hear it.

(*Dr Rudge*) I do not think there is anything I can do to summarise. We are grateful for your interest in this issue. I can only stress that while BT obviously has a strong interest in this whole field it is, in our view, totally critical on the national scale, not merely for BT but for every kind of business. The IT revolution and the information age is a reality and it is going to affect the way every business operates and the way every one of us leads our lives and should not be under-estimated. I think Government has to give it the priority that it deserves.

Chairman] Thank you very much.

Supplementary evidence by British Telecommunications plc (Sir Ian Vallance, Chairman)

At the QMW seminar on 29 April you asked what priority I placed on the various actions I was suggesting the Government might take to promote the Information Society.

Of course, any assignment of priorities to such a list is, to an extent, an inherently arbitrary exercise. But, it would be less than helpful if I simply asserted that all the suggestions I made were of equal weight. I also appreciate the need to allow some sort of trade off between the intrinsic importance of the proposals and their ease of implementation—which will inevitably be closely related to the potential effect on public expenditure.

Three of the activities I proposed would involve little or no incremental cost. Promoting the Information Society at all levels starting with the G7 conference, harmonising the treatment by the Government of the various aspects of the Information Society in legislation and administration, and pressing for full liberalisation of communications services throughout the European Union in 1998 would each serve to underpin what we are all trying to achieve. Such initiatives would be of undoubted benefit but would cost almost nothing.

We are then left with the suggestions which could have an impact on public expenditure. Here top priority must be given to encouraging private sector investment. There are currently two major impediments in the way of such investment, both of which are within Government's power to remove.

It is first necessary to ensure that the industry has resources to invest and is willing to do so. You will be aware that the majority of telecommunications operators in the UK are concerned that Oftel's current proposals on the regulation of BT's prices after 1997 will result in an industry which is blighted by reducing returns. Such as industry would, I suspect, be somewhat reluctant to make significant investment in the infrastructure on which the Information Society would depend.

The second impediment to be removed will come as no surprise. It is necessary to provide public telecommunications operators such as BT with the assurance that if they invest in broadband networks they will ultimately be able to use them for broadcast entertainment television. This is essential if such investment is to be commercially justified. As we have said on many occasions, all we want is a certain date for the removal of the restrictions so that we can plan.

I would give next priority to the provision by Government of support services such as training, expertise and administration for the users and implementers of the new services. This is very closely linked with the objective—to which I would give equal weight—of Government exploiting its role as a major buyer of IT. It is clear that if the Information Society is to be realised many people will need training. One of the barriers to effective use of multimedia technology in schools, for example, is the need to train teachers how to use it. By taking a leading role in deploying these technologies and training people in the public sector how to use them, the Government could play a material part in building up momentum.

I would put funding long-term, pre-competitive research and development last because I recognise that this involves material public expenditure. Many practical details, such as ownership of intellectual property rights, would also need to be resolved. This means that despite the usefulness of such activity, it could take some time to implement. An early start would, of course, minimise delay.

This leaves regulation. Here I would simply reiterate that without a suitable regulatory climate there may be little point in undertaking any of the other activities. I have already indicated that there is a serious danger that the proposed arrangements for regulating BT's prices may damage the UK's chances of building the Information Society. Getting regulation right is vital.

I. VALLANCE

Speech by Sir Iain Vallance, Chairman, BT, to QMW Public Policy Seminar—29th April 1996

GETTING THE MOST OUT OF THE INFORMATION SOCIETY

Good morning, ladies and gentlemen. I'm delighted to be here, and to be taking part in a debate which is of such critical importance to the commercial (and cultural) future of the UK.

Today, we are going to be adding to the millions of words that have already been spoken and written about the Information Society. It sometimes seems that there are as many visions of this fabulous creature as people who have opinions about it. But, at the very least, I suspect we can agree that it will make possible new ways of presenting and interacting with information. Having said which, perhaps I could begin by showing you something.

Those are corporate advertisements, and although you may well have seen them before, it seems to me that they make a number of points that are relevant to our discussions today. In a way, they are interesting because of what they are not. They are not about call stimulation, they are not about telephony, and they are not particularly about BT. In fact, they are about the generic benefits of communication, and about how technology can add value to our lives.

That Professor Hawking was willing to appear in the first commercial is, in itself, of significance. Here is a man whose ability to communicate and contribute to our understanding of the universe is made possible by technology. Without it—there would be no Brief History of Time. With it, as he says, "the possibilities are unbounded.

But it is, perhaps, the second commercial that really captures what I want to address today. It predicts a new age of communication in which "every child will be able to read every book", in which "doctors and teachers will share their knowledge with whoever needs it", and where "every conversation will take place face to face".

Implicit in both is our view of the Information Society—a society transformed by access to information and the ability to interact easily and effectively with that information. New multimedia services will reach homes, schools, offices, factories, and hospitals and will impact areas we cannot yet imagine. They will alter our lives profoundly. It is not a question of computer games or video on demand, but of fundamental changes in social behaviour. In effect, I believe and will be making the most of the Information Society when the benefits that these advertisements dramatise are available to all.

And these benefits are, in essence if not in delivery, simple. They are about enhancing (sometimes spectacularly) the things we already do and have always done—speaking, listening, looking. And the technology we employ to reach them must be easy and intuitive to use; it must not be difficult or intimidating. Without this vital ease of use, there will be no Information Society. But ease of use cannot of itself guarantee social change. The information revolution will be fostered and promoted by a number of other enablers.

Before I go any further, perhaps I should declare a fairly obvious interest. My locus in this debate is as Chairman of a commercial organisation. For me, picturing the future is not an academic debate; it is essentially about the search for new markets, new ways of meeting customers' changing needs and making money along the way. I have to make assumptions about the way things will go—and the risks are as enormous as the opportunities.

What is clear however is that there are two major trends at work in the communications industry today. The first of these is convergence. Once separate industries are converging and will continue to converge. Publishing and entertainment are increasingly becoming the information content business. Consumer electronics and personal computing are becoming the information apparatus business. Computing and telecommunications are becoming the information delivery business.

The second major trend is that this convergent communications industry will be–indeed it is already—a global one. As customers are increasingly wishing to operate around the world, so they are looking for suppliers who can do the whole job for them, end to end. And we are already seeing the emergence of a number of major global players. Not just Telecommunications companies such as BT and MCI, or AT&T but also IBM, Microsoft and others.

But in spite of all the variables and the range of companies and cultures involved, there is a (growing) consensus that several areas are likely to be impacted earliest. I'd like to say something about just a few of these.

First, let's take education. Easy access to and interaction with information will facilitate teaching and learning methods. The Internet will link schools to educational material. Virtual extended schools will meet the needs of children in remote locations. The distinctions between education and leisure will break down. Education will increasingly become a lifetime experience rather than simply being wasted on the young!

Telemedicine will also come into its own. GP surgeries and minor injuries units will be connected to remote expertise at major hospitals; medical consultations will take place over ISDN links; foetal heart scans will be transmitted to centres of neo-natal care; prescription databases will take some of the pain out of medical administration.

Public information services will be transformed. Communication between the public and a whole range of public bodies will be enhanced and speeded up.

Social services could free up resources to focus on more personal care. There might be remote, unobtrusive monitoring of the elderly or people with disabilities, thus giving them more autonomy, significantly enhancing quality of life while reducing the cost of care.

Financial and commercial applications will help to stimulate a more efficient and dynamic economy. The "virtual office" will become realities. Teleworking will help to relieve the pressure on city infrastructure and help to create opportunities for an improved quality of life.

I have, perhaps, been somewhat disingenuous in my use of the future tense. All the innovations I have mentioned, BT offers in one form or another *now*—all have reached at least the technology trial stage.

In the education field, for example, our offerings include CampusWorld, an Internet-based education resource service, matched to educational curricula, accessed at local rates and used by more than 2,500 schools.

Telemedicine is one of the wide range of applications for the CamNet "telepresence" system you saw earlier. A conventional audio headset mounted with a miniature TV camera and viewing screen, enables a doctor at a remote site to instruct paramedics at the scene of an accident.

We are currently conducting a large-scale marketing trial of Interactive services in East Anglia, including a local information service, educational programming, shopping, banking, and movies and music on demand. The technology is there *now* and it works.

I could go on, but subjecting you to a third BT commercial in one morning might be pushing my luck!

The point that I really want to make is that if BT—and, indeed, the UK—is to play a key role as a producer rather than just as a consumer of the Information Society, then innovation and development like this must continue to be encouraged and the best technologies must be adopted and brought to market.

If we simply wait for the future to happen, the danger is that we will be consigned to history. We have to work for the future and we have to invest in it. Embracing and helping to move the Information Society forward can enhance our national competitiveness in markets that are certain to constitute a significant slice of world GDP in the near future.

The key question is: what must we do to make sure that it happens and that we make the most of it?

First, there is the issue of universal provision. We can all agree that we must not create an information society of "haves" and "have nots"—the goal is a global village not a global middle-class suburb. But how can we square this with the claim that the Information Society will be built with private capital? At least a part of the answer is that we have to distinguish between the aim of universal availability and a universal service obligation. The former is ultimately the responsibility of Government and the latter is traditionally imposed on telephone companies. It is often achieved through the market, but only applied when sufficient numbers of people are shown to be in danger of being disadvantaged.

But, however we get there, universal service will require significant financing and care needs to be taken to ensure that it is really beneficial for all.

There is also an onus on commercial organisations to show how we can work together to bring the social and economic benefits of the Information Society closer. Many of us will, of course, be taking part in the DTI's Information Society Initiative which aims to persuade small and medium enterprises of the benefits the new technology offers. More generally, there are other encouraging signs of competitors co-operating where they have mutual interests: the Network Interconnection Consultative Committee and the Digital Audio Visual Council would be good examples.

Government also has a role to play in creating an environment which accelerates the development of the information society, providing incentives for innovation and the early adoption of applications and also in encouraging risk taking.

I believe that there are some very specific, practical, actions Government could—and indeed should—take.

One, is to promote the information society at all levels. Next month's G7 conference in South Africa is an opportunity for an early win/Two, is to stimulate the market by funding long-term, pre-competitive research and development. The final implementation of particular technologies should, I would suggest, be left to commercial decision-making by the market. Three, is to encourage private sector investment. Four, is to provide support services such as training, expertise and administration for the users and implementers of the new services. Five, is to exploit its role as a user and bring the benefits directly into millions of peoples' lives. Six, is to work harder to close the discrepancy between the apparent recognition of the commercial opportunities that convergence brings (witness that DTI Information Society Initiative) and the continued separate development of legislation and regulation (witness the Broadcasting Bill on digital terrestrial television which deals with new "data" services almost as an afterthought).

And, seven, it must push for communications services liberalisation becoming a reality in the European Union in 1998 and applying to *all* players, not just telecommunications. Reciprocity in the opening and development of markets should be a key factor in international negotiations.

And then there is the "R" word—regulation. BT's vision of an appropriate regulatory framework for the future is one which creates confident, sustainable conditions for investment, within which regulation can progressively withdraw, and in which competition can flourish. Regulation should be clear and predictable, and the regulator should not have unnecessary or inappropriate discretionary powers, without complementary rights of appeal. None of us is infallible.

What would be the essential characteristics of an appropriate regulatory regime? I would suggest, first, a light hand, with the emphasis on encouragement and commercial freedom rather than restrictions, and with safeguards rather than controls. Next, open customer access to the services and technologies of their choice with fair and reasonable terms for interconnection. There should also be a readiness and a capacity to face up to and deal with the implications of industry convergence; and, finally, we should see prices set competitively in a competitive market.

Between them, Government and the regulator can create an environment in which companies are prepared to invest, where innovation is encouraged and where there are adequate returns for stakeholders.

So, where are we now?

As I have said before, we have come a long way. In the UK, the last 12 years have seen our industry transformed by liberalisation. The UK now has the most open telecommunications market in the world, with about 150 licensed competitors. Customers have access to a wide range of high-quality innovative services at affordable prices. But if this momentum is to be maintained, we need urgently to re-examine the way in which our industry is regulated.

Many of you will be familiar with the broad terms of the debate bewteen BT and Oftel, but just to rehearse it very briefly.

We believe that Oftel's current proposals for price control regulation of BT do not adequately recognise the change in risk for future investment in our market and the resultant cost of capital. And this is, of course, an issue for the *whole* industry, not just for BT. The current signal to investors—both in the UK and overseas—is that markets elsewhere are likely to offer better returns for those wishing to invest in the Information Society.

There is also unnecessary uncertainty for BT and other licensees arising from the Director General's proposed sweeping powers on anti-competitive behaviour. We have to ask whether a single individual, the DG, ought to have the powers of prosecutor, judge, jury and executioner. Surely there must be some protection for operators against the regulator reaching the wrong conclusions. There must be some right of appeal rather than a presumption of regulatory infallibility that has hardly been borne out of past evidence.

The UK is in imminent danger of creating disincentives to investment in the networks and services that will form the nervous system of the Information Society. We can only hope that the coming months of regulatory review will bring a sensible solution.

Getting the most out of the Information Society will ultimately depend on getting the right relationships and getting the relationships right: between customers and suppliers and competitors; between the industry and Government; between the industry and the regulatory authorities; between the industry and shareholders; and between the users and the technology they use.

But, the issue of timing is crucial. And the time is now. We are facing a once-in-a-lifetime opportunity. The next few years will determine whether the UK plays a major part in creating the Information Society and reaps its rewards, or settles back into being an information backwater. The UK has the technology, the skills and the companies to grasp that opportunity. I only hope that it can come up with a matching public policy and regulatory framework.

Thank you.

29 April 1996

TUESDAY 30 APRIL 1996

Present:

Butterworth, L.	Hogg, B.
Flowers, L.	Hollick, L.
Gregson, L.	Phillips of Ellesmere, L. (Chairman)

Memorandum by the NatWest Group

A question that must be asked before any specific questions are answered is: Does the Government subscribe to the vision of the ISH? That is, that high-bandwidth communications channels will become widely available and will allow access to services based on full function multimedia presentation of information eg, video.

All that Government does should encourage the non-use of paper. This implies that other mechanisms than just electronic channels must be in place. For example, payment mechanisms and some form of electronic signature will be required, as will secure and robust cryptography.

We believe that there is already a mechanism in place that can provide much of that which is required to ensure the success of the ISH. This is the NatWest/Midland Mondex initiative. Currently, this provides a secure mechanism for the implementation of digital cash—a direct replacement for notes and coin. However, Mondex has been designed to allow expansion into other uses.

1. *What is the current form of the "Information Superhighway", and how is it developing (i) in the United Kingdom and (ii) worldwide? What specific problems arise from incompatible network standards and why are these incompatibilities arising?*

The answer to the question is crucially dependant on what is meant by "large amounts of data" within the given definition of "information superhighway" (ISH). Within the context of the ISH, "large amounts of data" is usually taken to mean "broad bandwith" or "broadband", that is to say a multimegabit data transfer rate as distinct from the multikilobit data transfer rate of basic rate ISDN. Multimegabit transfer rates allow services such as video to be delivered to users at acceptable visual quality.

Having added this extra clarification/qualification, it is our assessment that the ISH does not yet exist in the UK.

ISDN30 (as offered by BT and other public telephone operators) can offer a multimegabit data transfer rate but it is not publicly available. Similarly, whilst in some metropolitan areas, especially the City of London, there are telephone companies offering broadband optical fibre-based networks, these are not available to the general public. Finally, the cable TV companies operate a broadband fibre/coaxial network to deliver TV pictures but this is not a switched network ie, it is not capable of "transferring large amounts of information *between* users". The telephony service (a "switched" service) provided by the CATV companies also uses a broadband network—but not right into the home and therefore this does not qualify as a "publicly accessible network".

In our assessment, the ISH as defined does not yet exist in any country.

Except in one trial (Cambridge—see later), the ISH, *as defined,* is *not* being developed in the UK, although the CATV companies *are* laying publicly accessible high bandwidth networks within their franchises; but see the qualification above. These networks, though, appear not to be built to a single, common standard or architecture.

British Telecom could build the required optical fibre infrastructure for an ISH. However, they feel that current legislative constraints on them which stop them providing "entertainment", means that there is little commercial incentive to do anything yet.

World-wide, ISH development is often being funded by Governments. For example, the Singapore government is building and controlling ISH developments in a very centralist manner. Many governments see the ISH as being an infrastructure which is essential for the businesses of the future. In the US, a significant number of serious trials have been planned or underway for some time and many more are being mobilised. However, the UK does have two privately funded trials underway that are world leaders in their use of technology (see later).

The Internet is often quoted as being the first incarnation of ISH. However, it is more a "B Road" rather than a Superhighway. The availability of broadband communications to *all* users is not a reality today. The Internet Multicast Backbone (MBone) does provide an ISH-like bandwidth capability but cannot be considered to be generally available since it requires dedicated, high speed connections as well as powerful workstation computers to drive it.

The Internet does show one model of how the ISH could be built and operated. The Internet is based on collaboration and agreement between participating companies on an informal basis. Overall governance of the Internet is not the responsibility of a single corporation but is vested in all the corporations that make it up. Standards are agreed by majority vote and are "open", in that no one company owns them, and are freely available to all comers.

Standards are key to the successful operation of a major market. In terms of standards, these are still relatively early days for the ISH. However, it is in the interest of all suppliers to carve out agreement. No one can afford to back the wrong horse. So, unless standards emerge quickly, for most the answer will be to diversify risk by backing/sharing several standards. However, there is a cost associated with backing multiple standards. This cost can be avoided.

Some issues which can arise from incompatible network standards are:

- the cost of developing conversion mechanisms and the time required to do it
- the time wasted arguing over who should change and what to change
- the cost to the consumer of redundant/outmoded equipment

This last issue can lead to consumer reluctance to spend until a safe standard emerges which then delays the rate of take-up, which delays return, which delays investment, etc. The net result is delay in adoption.

The reasons for incompatible standards are due mainly to commercial pressures. Companies tend to develop ideas in isolation, rightly protecting their intellectual property. In most cases they are looking to lock users into their product and thus have an incentive to use proprietary standards that competitors cannot use without the payment of licence fees. Over time, market forces will sort out the winners and losers, and *de facto* standards will emerge. An example of this in action was the VHS and BetaMax conflict in the area of home video recording standards.

Government should not be tempted into directing/choosing standards too early in the cycle. The track record of the ability of government to guess what the correct standards are early in the cycle is not good. Market forces are a better mechanism for finding *de facto* standards quickly. However, a free and level playing field must be provided. Also, some time must be allowed for *de facto* standards to emerge and, once they have emerged, government must support them.

2. *What services are being provided, and (should be developed/will be required), within for example the following areas:*

(i) public information,
(ii) commerce,
(iii) finance,
(iv) education,
(v) industrial training,
(vi) health,
(vii) social service, and
(viii) entertainment?

We assume that "commerce" includes all aspects of doing business. That is, advertising, marketing, supplying, etc.

Massive amounts of information will be able to flow across the globe as easily as a telephone conversation does today, allowing the possibility of completely new ways of communicating. Consequently, the ISH opens up a huge world of opportunity for all sorts of information providers and businesses to create exciting new applications/services for new markets.

NatWest is closely involved in two consumer trials currently taking place which utilise genuinely broadband networks. These are:

1. BT's Colchester/Ipswich trial involving approximately 2,500 households;
2. the Cambridge trial, managed by Online Media involving approximately 100 households and eight schools.

These trials currently allow the transfer of large amounts of data but, in both cases, the volume transfer is currently one way—to the consumer. In both trials, there is only a low volume data transfer in the reverse direction—for example, to the bank, although the Online Media trial has the *capability* to transfer large data amounts in *both* directions through the use of Asynchronous Transfer Mode (ATM) technology.

Both trials offer the following services:

- public information
- electronic commerce in the shape of home shopping
- a finance service offering information on personal bank accounts, bill payments, value transfers, statement history as well as information on (and, in come cases, purchase of) other bank products such as loans, pensions, mortgages, insurance, travel facilities
- educational material
- entertainment (true video on demand, computer games).

We see all of the listed services being developed/required over the next few years. However, they can only evolve after the trial stage as the physical communications infrastructure is put in place and if there is a firm base of standards for the basic levels of the ISH eg, message formats and network infrastructure.

In addition, one crucial area not mentioned is that of payments, billing and settlement services. These are essential to complete any form of commerce over a network (Internet or ISH or proprietary).

Other additional services could include:

- information/service brokerage
- information search
- news
- government services (eg, Job Centre information)
- local/regional groups
- special interest groups.

Regardless of what services are provided, they must be easy to use by the customer. Services which may be useful but are hard for consumers to operate or navigate around will wither and die. There is a need for brokerage and service integrators to deliver usable services.

3. *Who will supply these services to consumers in the United Kingdom? How can the participating companies be categorised and what is the nature of the commercial relationships between them? How are suppliers likely to develop? What* service *standards exist and how are they likely to evolve?*

In the UK, a mix of public bodies, for example, local councils, and private sector business (of all sizes) will provide the services. This should be on the basis of market forces for commercial offerings and public subsidy for others eg public information. Many suppliers of information will provide some services free as a lure (cf. the Internet now).

Service providers can be categorised in a number of ways. One possible way might be:

- information providers (public and private sector)
- entertainment providers (eg films, music, games)
- intangible services (eg financial services, "tickets")
- tangible goods (home shopping)

Another categorisation could be:

- content
- transport (ie the commercial networks)
- customer equipment
- navigation/browser
- broker

That said, there does not really seem to be any gain from categorising companies. Organisations will migrate, at speed, into sectors in which they have not previously operated because they perceive an opportunity. The main organisational attributes could well be to be small and fast moving as well as innovative.

Commercial relationships will develop as and when overlap/interaction become apparent and it is commercially worthwhile, for example, to achieve critical mass. An existing relationship might well prove to be the catalyst. For example, the BarclaySquare initiative on the Internet where Barclays Bank used an existing relationship with some of its BarclayCard merchants as a basis for building an electronic shopping centre. In the electronic shopping centre, the merchants display their goods in their own, branded areas and Barclays facilitates the payment by the customer through the customer's BarclayCard.

Service providers might provide the services in their own right or through the auspices of better known names, which will lend credibility to their service offering (eg in terms of performance or quality guarantee). These "better known names" could take a brokerage fee on every service/product sold or take them and sell them under their own brand name.

The ISH reduces/removes many barriers to entry as well as widening the distribution potential for small, currently very localised companies.

Service standards currently in existence for finance are: Electronic Data Interchange (EDI) and its derivatives, international payment systems (SWIFT), and international debit and credit cards (MasterCard and VISA).

Other service-related standards that exist for finance are the use of (US) English as the de facto language, and the use of the Dollar as the currency of commerce.

Service standards will need to evolve to cater for new media and modes of operation. For example, the standards definition process will have to be speeded up—2 years to set a standard will not be tolerated by the market place.

4. *How can universal access to services provided for the common good be secured within a commercially competitive market framework?*

There is a need to recognise the distinction between a commercially competitive domestic environment and ensuring that domestic companies are not thereby limited in their ability to compete on the world stage.

It is probably true to say that without the artificial stimulus afforded the CATV companies (eg, the Duopoly review), UK cable TV would not have developed as quickly as it has. But continuing to hold back British Telecom from offering a service which might induce it to lay a competing broadband network cannot be optimal either.

Even though the technology is embryonic, there is still a plethora of equipment which the consumer is being encouraged to buy: games consoles, PCs, PC/TV, satellite decoders, CATV set top boxes, Internet access boxes. Such competition can stimulate equipment and service providers but the consumers can be forgiven for being confused. Does Government have a role in encouraging consumers to buy certain types of equipment, eg through tax advantages?

UK plc needs a national infrastructure for the network proper to give access to the vast majority. Cellular phones is an example of how not to go about building an infrastructure. The current set-up duplicates coverage (eg, Mercury, Cellnet, Vodaphone, Orange) in the areas where coverage is cheap to install (eg, large conurbations) and misses out expensive areas (eg, highlands of Scotland). Cable TV franchises are a possible model for how to do it—extended with Government subsidy for the hard to reach areas.

Universal access for the general population can be provided by a number of means. For example:

- direct connection to the ISH for those who can afford it;
- shared resources hired/rented on a "per use" basis eg, the Internet CyberCafes; and
- public resources available in eg, libraries but possibly with limited functionality.

Government could provide usage credits in the form of a smart card device which not only identifies the user but allows them x units of ISH access as a basic right. Further credits could be purchased as and when required.

There is also a support requirement for general usage by the populace. Where will the help forums be to allow people to use the new ISH tools? Will they be in local libraries? Perhaps in "telecottages" built specifically for the purpose? Perhaps in high street locations previously occupied by businesses which are now defunct or have moved out of town?

5. *What is the role of central Government in connection with the "Information Superhighway" service provision, including the following areas:*

(i) leadership;

(ii) promoting inward investment;

(iii) promoting and safeguarding the interests of UK firms worldwide;

(iv) promoting network compatibility;

(v) access to Government information;

(vi) security of payment;

(vii) data protection, confidentiality and censorship;

(viii) verification of information; and

(ix) promoting the development of UK-oriented software?

(i) By leadership through example. For example, we are asked to submit this text on paper and not by electronic means. In the US, ITTs are usually sent out electronically. Those companies without an electronic connection are at a significant disadvantage.

By providing a legislative framework. The regulators must be in step with what is possible. Government must be able to respond with faster legislative changes to meet the new ISH led market. For example, the Consumer Credit Act assumes all transactions are paper based—how long before electronic interaction is recognised? This sort of delay can prove to be a significant brake on innovation and development.

By encouraging consumers to buy certain types of equipment eg, through tax advantages?

By actively consulting interested/relevant parties then stating a vision and a timeframe within which that vision should be attained.

(ii) Through eg, research tax credits, recognising that research is required.

By ensuring an open, competitive marketplace, perhaps with exclusivity given in certain areas for set periods of time.

By encouraging infrastructure development and investment while protecting the consumer from exploitation of any monopoly which might be established.

(iii) By recognising the distinction between a commercially competitive domestic environment and the need to ensure that domestic companies are not thereby limited in their ability to compete on the world stage.

By recognising that the ISH will make the entry of new companies into Financial Services much easier to accomplish. The overheads of establishing a physical presence in the market place as well as maintaining existing overheads, for example, cheque clearing systems, will not be present for new entrants. There is a risk to the consumer of allowing ad hoc entry into such a sensitive marketplace. Control and regulation will still be key issues for Government.

(iv) Through infrastructure control and guidance. Those that comply with established standards could be rewarded through mechanisms such as tax gains, grants, etc.

By actively involving itself in the development and agreement of standards; by moving to establish UK standards which can become de facto world standards if need be.

(v) Through legislation like the US Freedom of Information Act.

By ensuring that Government is active in promoting internally the use of the ISH and in its use of it in an external capacity to inform its citizens (as now); by seeking to accept information/data exclusively in digital format rather than relying on paper.

(vi) Through the appropriate channels, ie, finance organisations, and allowing ready access to high-quality, universally agreed standard encryption technology.

By encouraging/incentivising banks to develop electronic payment/billing/settlement systems; by investigating and, perhaps recommending encryption standards; by encouraging initiatives such as Mondex with tangible effort rather than mere passive acceptance and supportive comment. Beyond security of payment there is a need to investigate authentication procedures eg, electronic signatures.

(vii) Through ready access to high-quality, universally agreed standard encryption technology—censorship is a non-starter and, arguably, should not even be attempted as it will incur significant costs to achieve very little. Censorship on an ISH will be almost impossible to police.

See (vi) above but also by ensuring that data protection, confidentiality and legal/regulatory and compliance requirements do not create a situation whereby an individual cannot see the wood for the trees. For example, it might be considered "a good thing" that individuals make provision for their own retirement. Retirement pension and savings plans can be explained much more easily using self-service multimedia techniques which allow the consumer to build knowledge and acquire information at her/his own pace and from a position of much wider knowledge of the marketplace. If however, service providers are required to put regulatory statements on every screen then this is not an encouragement to the consumer to explore. In other words, the greater benefit, that is, the individual making provision for retirement, is not achieved as a direct result of a misguided attempt to protect her/him! Government must find some mechanism to provide the protection for the consumer without overwhelming her/him with detail.

(viii) Through ready access to high-quality, universally agreed standard encryption technology which supports electronic signatures to authenticate the parties involved; also by ensuring accreditation perhaps of the information providers.

(ix) This is not a problem—globally available software is usable in the UK since it is designed for multi-country operation—specific UK software will be developed if there is a demand/market—this is perhaps dependent upon having an open competitive environment in interactive, networked service provision.

The big issue here is that ISH (and especially the Internet today) cuts across national boundaries with a vengeance. Whose laws apply in a transaction from someone using a UK-built PC running American software over a European network provider to buy goods from a company in Australia paid for from a US bank account? Some form of global legislation and enforcement is required but how likely is it? The UN still suffers after 50 years!

Does the supplier of product/service, on accepting an order however received, have a duty to ensure that the goods do not contravene any laws in the place where they will be used? If so, in the world of the ISH, this will require International agreements. Can these be built? If they can, can they be policed and enforced at sensible costs?

Government must also ensure that the UK customer of any UK-based financial service supplied on the ISH is protected to the same extent that they are today since the ISH will create opportunities for many new entrants into the Financial Services sector. Regulation and licensing will be key to this protection. The cowboy operators must be kept off the ISH and the best way to do that is to ensure that only those finance companies that have a licence to trade and are regulated by an appropriate body are allowed to do business.

Protection for UK customers of international companies will be more problematic. This will require global agreements and policing arrangements to be put in place. Government needs to start the negotiating process now and influence matters from the outset before positions become too entrenched.

6. *What is the role of local and regional Government in connection with the "Information Superhighway"? How can new services be used to boost (a) the ongoing regeneration of urban areas, (b) other local economies?*

Local and Regional Government can take their steer from central Government in their internal and external use of the ISH. The ISH tends to remove, or certainly reduce, the need for physical presence eg less need for bank branches or retail outlets and so traditional High Streets could see an adverse impact. Likewise, the employment in these local areas could fall.

There is a need, therefore, to consider what job creation opportunities there are. For example, if the ISH lessens/removes the need for people to commute (eg through increased use of teleworking) then there will be a beneficial impact on the environment—less traffic on roads, fewer queues at the station car park, and, being social animals, people will want to get out of their homes even if they are teleworkers.

Perhaps then there will be a need for coffee shops or meeting houses. Maybe the old Lloyds Coffee Shops will rise from the ashes? Perhaps the local library will get a boost, particularly if it offers teleworking services.

Local and Regional Government should promote local initiatives eg the East Midlands Network (EMNET) and Sunderland initiatives being undertaken today on the Internet which involve NatWest Bank. Local and regional government must also provide local funding and information.

We believe that the new services cannot, *per se*, boost the ongoing regeneration of urban areas. Providers of non-physical services will be free (through the mechanism of the ISH) to locate where they want to be. The main weapon available to government will be fiscal. All else being equal, companies will tend to locate where there is an environment suiting the owners and workers. This is unlikely to be in a regeneration area unless a suitable environment has been built.

Government will probably have to apply inducements, possibly in the form of grants or tax credits, to draw companies into such areas.

It is conceivable that the ISH could have a negative effect and draw established firms out from regeneration areas by giving them the freedom to be anywhere—probably even in another country.

Where physical goods are involved in ISH transactions, then there may be room for growth in local services to handle eg returned goods.

7. *What will be the impact of the "Information Superhighway" on working practices and employment prospects?*

ISH impact on working practices and employment prospects is potentially enormous. Distributed working is already a reality on the Internet and is likely to become even more so with high-bandwidth ISH. There will be less commuting and more teleworking.

With the ISH, we can disassemble the conventional manufacturer—wholesaler—retailer value chain. What is to stop the manufacturers selling direct to the consumer? The possibilities are innumerable and profound.

There will be less need for physical branches/outlets and sales staff since the highway will provide the information that these supplied.

Employment practices will tend to become more flexible. The current trend away from "jobs for life" will continue and will lead to short term contract working. The ISH will provide the mechanism for both finding workers and allowing them to work. There will be much greater exposure to potential employers and job opportunities. The issue is one of training people how to learn continuously, but even here the ISH could help by providing distance learning opportunities.

There will be less need for people to move away from their home town and families in search of work. This should lead to improved family stability and, perhaps, less crime. The physical barriers to job mobility will be greatly reduced.

The Internet is showing that the infrastructure is now available to many more than in the days when only the big players could afford to invest in an infrastructure. An ISH which is generally available will reach many more small businesses, and there will be many more small businesses for it to reach. The ISH will also extend the business reach for small businesses. For example, a supplier of local specialist cheeses will be able to advertise their products across the UK and probably across the world as well.

The ISH will reduce the costs of entry for small businesses into a larger market place.

8. *Is the dominance of mass-market US software a threat or an opportunity? What hard* commercial *initiatives can be made (as opposed to "collaborative" ventures such as RACE or ESPRIT) to respond to this dominance?*

US dominance in mass-market software is a threat to UK software companies. US companies tend to be more innovative and faster moving than their UK counterparts and also seem to have more support from their Federal Government.

Any proposed commercial initiatives would need to involve innovative companies with vision and flair. Again, Government can help by encouraging and rewarding any innovation and research which is undertaken.

18 January 1996

Examination of witness

MR STEPHEN DE LOOZE, NatWest Group, called in and examined.

Chairman

547. Good morning, Mr de Looze. Thank you for coming. Perhaps you could introduce yourself and then make whatever introductory statement you think most appropriate?

(*Mr de Looze*) Thank you, my Lord Chairman. Stephen de Looze, Senior Executive, New Delivery Channels, NatWest Bank. A very brief introduction: I am responsible for the Bank's two interactive TV trials with BT and On-Line Media, and I also have responsibility to look at the emerging technologies in respect of new channels—PC, satellite, Internet and cable TV.

548. Perhaps you could tell us something about the question which has come up several times in evidence about secure mechanisms on the Internet for the transfer of payments and so on, which must be a major concern?

A. Yes, it is. It is certainly a concern to many people. The Internet is an open system and the problems are two-fold. One is the authentication of the parties on each end of the wire. How do I know, for example, when a screen with Tesco comes up before me, I know I am talking to Tesco, and how does Tesco know it is talking to me? So we need to authenticate the parties involved. Secondly, there is a need for a secure transfer of value between the two parties. At the moment, there is a lot of work being undertaken in both those areas. On the security side, the encryption techniques are being developed by the international card schemes—MasterCard, Visa—in conjunction with people like Netscape to develop the encryption algorithms which will allow secure transfer of value. In addition, NatWest has developed the Mondex card, which has very secure chip card technology which will allow, or can allow, both the authentication of the parties involved and a secure transfer of value between two valid Mondex "purses".

Lord Flowers

549. I think there is a great nervousness about giving credit card numbers and things like that at the present time. There is very little evidence that it is safe, although I do not have evidence it is not, never having been stung. Should the Government take some part in security, either of electronic payments or of encryption more generally than that, protecting consumers, protecting users and so on? Should there be some amendment to the Consumer Credit Act for that matter?

A. I think, if I may, I will first of all state that there has been an awful lot of hype and media discussion about the security of the Internet, but people appear to be very willing to give their credit card numbers over the telephone for such things as ordering cinema tickets or purchasing flowers, so in reality we are already faced with giving out our credit card numbers in an open, insecure environment. The role of the Government is a difficult one in terms of deciding which standards to put in place, because the Internet and indeed all the emerging channels are global channels, so there is a need for internationally agreed standards. The second point I would make is that at this stage it is a little bit frothy, in that we do not know which standards will emerge as the leading standards, which ones are the *de facto* standards, and there is a danger of Government stepping in too early and nailing its colours to a particular security standard mast, as it were. I do think it is incumbent upon Government to monitor what is happening and as *de facto* standards emerge, perhaps to encourage the use of those *de facto* standards.

550. Use here or use internationally?

A. There is certainly a need to consider the protection of our own citizens, but I do not believe you can separate or distinguish in this new world local standards from international standards.

Lord Flowers *contd.*]

551. Is there a forum in which you can talk about setting and maintaining international standards?

A. There are some fora, yes. There are the ones I referred to, the international card systems schemes for MasterCard and Visa, and the banks also have an international standard in terms of SWIFT for their international fund transfers, and there are emerging standards in terms of electronic data interchange.

552. You say that people are giving their credit card numbers fairly freely, is there a rapid growth in this practice, and does it spread to large firms who have real money to chuck around?

A. From an individual view-point I think it is growing rapidly. There is a much greater propensity to purchase items over the telephone, and inevitably I think that leads to a desire by the supplier of those goods and services to ask for payment via credit card. It is a very efficient method of transferring value and I do not sense any great reluctance on the part of consumers when it comes to giving out their credit card information, indeed I would go on to point out that it is not unusual for consumers to fill out an application form, a request for a particular item, in a paper format, often a reply paid postcard, which goes in the normal mail and anybody can see the credit card number and the details on that piece of paper.

553. It is very interesting that you are telling us quite a different story from your perspective from what many of our witnesses have told us. The usual story which has come to us hitherto has been that security of payment, or absence of it, is one of the main barriers to the development of Superhighway practices.

A. I did not mean to suggest that it was not an important issue, I was trying to put it in context, in that we are already faced with insecure environments into which we freely give our credit card details without any apparent concern, and then we set that against the use of the Internet or PC-based systems, where for whatever reason this is perceived to be a much greater concern. It is indeed a concern and banks like NatWest are very keen to ensure that the privacy and confidentiality of data is ensured.

Chairman

554. As a bank which runs at least two credit card systems, do you have any evidence of fraud resulting from this rather care-free use of credit cards by customers?

A. I am afraid I do not have any information of that at my fingertips, but if my Lord Chairman would require it, we can always provide you with a private submission.

Lord Gregson

555. There is, of course, a large unit working on this all the time, is there not? Barclays, for instance, have a unit in Manchester which employs several hundred people dealing with the question of credit card fraud.

A. Yes, credit card fraud clearly is a significant issue for us but in relation to the total value of transactions conducted, it is in relative terms a very small proportion. But, as you point out, banks are constantly striving to improve security and reduce fraud levels.

Baroness Hogg

556. The key issue surely is, is fraud growing less than proportionately, proportionately or more than proportionately than the growth of this, as you say, rather vulnerable method of using credit cards? To take up Lord Flowers' point, if it is the case that anxiety about security is an inhibition on growth, the same inhibition would arise if the trust and confidence in methods used presently were fractured by views about the level of fraud. I appreciate your sensitivity about discussing the issue, but would you have any further comment to make on the likelihood of anxiety about electronic means being an inhibition on growth compared with the rapid growth we have seen of methods which, as you rightly say, look superficially at least much more vulnerable?

A. I think it will be a brake on the rate at which electronic commerce will develop.

557. Are we more frightened, in other words, about playing around on screens than nattering over a telephone, even if one is more unsafe than another?

A. I think we are.

Lord Gregson

558. I used to be involved in the encryption business some years ago, and there is no doubt the two leading authorities in the world today in encryption are America and the UK. The UK unit is GCHQ at Cheltenham. Do you have any contact with the defence field in helping you on encryption?

A. Not to my knowledge.

559. It is an enormous waste, in my opinion, not to have that expert knowledge available to you. The other thing is that modern encryption depends entirely on a completely digital system because it is computer-handled, is it not the case that you really will not develop a secure service until you are fully digitised?

A. That is probably true, yes. To go a little further on your earlier point, we have strong relationships with a number of the hardware and software suppliers, for example IBM and ICL, so we are in liaison with them concerning encryption systems.

560. What worries me is, as you probably know, there is a clamp, you are not allowed to discuss encryption above a certain level. The ABC Agreement means that the Americans control the extent to which anybody could be allowed to discuss encryption at either the diplomatic or defence level, so you only discuss it with equipment manufactured at a fairly low level of encryption by definition. Even that depends on a fully digitised system.

A. That is true.

561. What worries me is that if you push this too far on an on-line basis, are you not causing problems which will bring the system into disrepute which could have been better provided when the whole

Lord Gregson *contd.*]

system is digitised? In other words, will you start too fast and ruin the whole thing before you get going?

A. I must say I am not an expert in encryption technology, but it is my understanding we are talking about a fully digitised system here.

Lord Flowers

562. There is something called "Pretty Good Privacy"[1] or something like that, which apparently can be used to give you security much higher than you would normally need for ordinary transactions, but it would not be good enough for high-faluting defence matters, and this seems to be spreading. Does NatWest use it? Do you have a view about it?

A. I think what I refer to is what my Lord referred to earlier, which is that the encryption technologies are controlled by the US Government who have placed a restriction on the export above a certain level.

563. Yes, but the question is whether below that level is satisfactory for most commercial purposes?

A. Any encryption is better than no encryption, but clearly the higher the number of bits stored in the encryption, ultimately the greater the level of security. As I understand it also, many of the academic papers on which the encryption systems are based are freely available in any case and there is absolutely nothing to stop anybody developing an encryption algorithm based upon those freely available academic papers.

Lord Gregson] And they are not difficult to bust at that level.

Lord Hollick

564. I am aware of at least three sites on the Internet where you can trade, indeed I have bought products on one of those sites, and you either pay by sending through the credit card on-line or phoning up; I have always phoned up, and in speaking to the people at the other end, they say that the vast majority do exactly the same. For two reasons, one, because there is a concern about the privacy issue and releasing your credit card number, and I think that is a very real concern, and the second is, I suspect, a concern about the cost of putting in an encryption system. Have you modelled the cost of putting in an encryption system on behalf of your customers as against people using a phone which, you rightly say, they are very happy to do? Is there a cost factor which has put off customers who are trying to trade off the Internet from putting in such a system?

A. We have not done any modelling of the differences, but I do not believe the cost is anything more than modest. I do not believe the cost of encryption is a barrier to our employing an encryption system.

565. So are you going to offer that to your card holders, an electronic encryption system alongside the normal card system that you have?

A. I am not aware in detail of our plans for acquiring credit card or debit card transactions over the Internet. To a degree we are not in control. If our retail customers decide to offer their services over the Internet and are prepared to accept credit card payments, the time at which the banks would get involved is when those payments are put into the processing system. We cannot insist that a retailer must offer an encrypted secure method of taking that payment.

Baroness Hogg

566. But you do not refuse to accept to authenticate payments made in that way?

A. No[2].

Lord Hollick

567. Are you not at risk, because if I use my account with a bank to pay for this particular transaction and somebody else gets the details of my personal account and proceeds to plunder it, you are at risk rather than my being at risk? Is that correct?

A. Within the regulations and rules governing your holding of a card, yes, we would be liable for any fraudulent misuse of that card above £50 assuming that the cardholder had exercised all reasonable care him/herself. It is not quite clear how retailers are actually taking credit card payments over the Net. It is my belief that many of them simply take the electronic message which says, "Fred Smith would like to pay by Visa, number so-and-so", and then they would feed that manually into the credit card authorising system. It is not a seamless, fully integrated method. So at the point it enters our system I suspect we do not know the origin of that payment; we cannot tell whether it has come via the Internet or via CompuServe or via the telephone. We simply get a message to put it into our processing system, in the same way if you had used a telephone and somebody had taken down the details and then somebody re-enters those card details into the credit card system.

Chairman

568. You mention the role of CompuServe as an intermediary in this. Are people happier about giving CompuServe their credit card number and then making payments through that intermediary?

A. I believe they are, inasmuch CompuServe brings some order to the current chaos of the Internet. It is a much more managed service.

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[1] Pretty Good Privacy (PGP) is a computer program originally written by Philip Zimmerman which implements a very secure form of public key encryption based on Rivest-Shamir-Adleman (RSA) algorithms. PGP combines public key cryptography with message digests, data compression and key management. Philip Zimmerman has made PGP freely available via the Internet to "empower people to take privacy into their own hands". See http://www.ifi.uio.no/~staalesc/PGP for more information.

[2] It is difficult to conceive how banks would know the method by which card numbers reached the merchant.

Lord Flowers

569. Are the financial operations which you have just described of CompuServe overseen in any way by proper bankers or the like? How can you be sure that CompuServe or any other firm which sets up to handle payments for you is doing it to the sort of standard you would wish to see as a bank?

A. First of all, CompuServe will only act as a manager of that network, it will be the individual retailers on the CompuServe network which will be involved in the acquiring of payment. So CompuServe, I assume, will carry out some sort of check of their own to ensure the *bona fides* of the service providers. The service providers themselves will have been vetted by the banks in the normal course of their business as regards their suitability to acquire credit card payment, and I am not aware of any additional checks that banks would undertake.

570. So as far as you know, there is no banking supervision of financial operations on the Internet?

A. As far as I am aware personally, no.

Chairman

571. To summarise this part of the discussion, your organisation is I gather not particularly worried about the possible growth in credit card transactions via the Internet?

A. I would not have phrased it quite like that. I would say we cannot ignore the Internet and any on-line service channel, and electronic commerce cannot function without an electronic payment system. The banks clearly have a major role in the provision of that payment system, and we have a responsibility to ensure that fraud is minimised and that the confidentiality and privacy of our customers is respected. In that sense, we will be working hard to ensure, as far as we can influence, there are secure methods of transferring value and methods of authenticating the parties involved in the transaction.

572. What sort of guidance will you give to your customers then?

A. That is a moot point. We have not given any guidance at all yet as regards use of the Internet by our customers. I am not sure whether it is incumbent upon banks to do that beyond simply stating, “take especial care whenever using a credit card in a transaction, as you would do normally to protect the privacy of your card.” I am not sure that banks can go any further than that at this stage.

Baroness Hogg

573. You yourselves, however, are not engaged in financial transactions directly with customers via the Internet?

A. I am not sure I understand the sense of that?

574. The picture you have been giving us is of credit card use of various kinds with retailers which may be transacted through the Internet, but as far as you are concerned that comes to you not through the Internet but through your credit card network system. So my question therefore is, are you entirely at arm’s length from the Internet or are there other forms of transactions by which you are relating directly with the end-user or customer through the Internet?

A. I think the banks generally act as third parties, as enablers within a transaction. We have our own internal communications networks along which value is transferred between parties, so it could be the CHAPS system within the City for large value payments, it could be the SWIFT system for inter-country transfers, or it could of course be a simple messaging system which our customers use to transfer value between their accounts in the same way that we have a telephone banking service whereby you can automatically transfer value either to a third party or between accounts. So in that sense we are directly involved.

575. But I cannot buy financial products from NatWest Bank directly through the Internet?

A. No.

Lord Gregson

576. The thing which puzzles me about the use of encryption is that I do not know how you would handle the encryption in 20 million homes, for instance. If you use a standard encryption technique, can I just remind you about the Germans’ mistake in doing this with Enigma where they standardised the delivery of the device so it could be used universally throughout the whole of the German defence services. Of course it just needs a fairly concentrated effort to crack it, and you crack the lot. I do not see how you could have encrypted messages coming to you from 20 million customers on a discreet basis. It does not seem possible to me.

A. If I could remind you, I am not an expert in this area, but I believe that the essence of the modern encryption is public key cryptography, and it is quite possible to emplace the public or private keys—I forget which, or both—within PC software or indeed on a card. So it is not difficult, as I understand it.

577. It is very, very simple encryption, I must say, to put it on a card.

A. I beg to differ. I think the Mondex chip technology is probably the most advanced of its kind using public key cryptography.

578. Mondex would be available to anybody to use? Would Mondex accept 20 million customers?

A. Yes.

579. On an encryption device based on a card?

A. The encryption system is contained within the chip set on the card. Mondex at the moment is only in one pilot in the UK (Swindon) but theoretically there is no reason why that should not be issued in millions worldwide, not just in the UK.

Lord Gregson] It sounds awfully like Enigma to me!

Chairman] There are, of course, people who tell us, quite rightly, that an Information Superhighway does not yet exist and it awaits the development of appropriate broadband networks which are not universally available, but there are of course some trials going on with broadband networks with which you are involved, and Baroness Hogg would like to pursue that.

Baroness Hogg

580. I would like to ask if NatWest has yet drawn any conclusions about the development of services from its involvement in the East Anglian trials using broadband networks?

A. We have drawn some early conclusions. I realise we are in public and therefore I am a little reluctant to disclose too much in public but if need be I can provide a separate submission[3]. The first thing is that the technology works, and it is a credit to BT and On-Line Media, the other trial, that the technology does work. It is leading edge technology of which we can be proud. Customers or trialists are using the services and are finding them extremely enjoyable, easy to use, and they are adding value. The big question which remains unanswered at this stage is to what extent are they prepared to pay for those services, which is particularly relevant and appropriate within banking circles given our basic account is provided free of charge to the vast majority of our customers. Within the banking service we provide two services, one is a straight forward account management service whereby customers can check their balances, their statement history, pay bills and make transfers, and the second element of the service is available to everybody on the trial, including our customers, whereby we give information on a range of our services—personal finance, credit cards, savings products, pensions, small business services, insurance and travel services. The first conclusion is that our customers by and large are using the account management transactional side of the service much more than checking out the other services. Banks, I would guess, are still considered to be mainly a simple provider of transactional services. We have not yet analysed in detail the demographics associated with the use of the system.

Chairman

581. You do have strong competition from companies which run exclusively a direct line service to customers. To what extent does the potential availability of broadband networks put you in a position of extreme competition with companies of that sort, and what plans are you making to develop it?

A. Up to now, the existence of a large branch network has been a major barrier to entry into our market place. It is clear that with electronic delivery methods there are no entry barriers, in fact one could almost say there is an exit barrier now for some banks because of the weight of our network. It is quite clear also that technology can assist us in making many of the straight forward decisions such as credit scoring for personal finance. Many of the other transactions are completely automated—checking a balance, paying a bill, checking a statement—so from that it is easy to see why new competitors of a non-traditional nature could come into our market place. We have seen Marks & Spencer come into the retail financial services, Virgin as well, and the credit card market place is almost completely fragmented now. So yes, there is a threat; a threat to the traditional players and some would argue a good thing and we should have more choice and more competition. One thing that is important to note is that the mere existence of the Internet allows consumers to find financial institutions elsewhere around the world, and if need be, depending upon laws governing the opening of accounts and whatever, to enter into a relationship with them. It may well be, for example, that people have heard of Bank of America, say, or Chase Chemical, an august body with a high reputation, but equally I suspect there is a danger that smaller institutions with no investor protection *could* attract consumers from the UK. I think there is a need to ensure that the regulations governing the operations of banks and accreditation of banks and financial institutions are monitored and are implemented to protect the consumer.

582. How far would you say the major banking system in the UK is being reduced to cash points in appropriate numbers of locations so that people can get their hands on bank notes when they need them, together with a remote Internet telephone system for the rest of what is needed?

A. In theory that could happen now. With Mondex you do not even need cash points, we can down-load electronic cash into your home over a Mondex terminal, so in theory most of the basic transactions satisfy more than 80 per cent of our requirements and can be accomplished now, almost totally automatically without the need for a physical high street presence.

583. That is clearly an important consequence of this development for the community. What prevents them being implemented even more quickly?

A. Banks still have a duty of care to their employees. The stakeholders in our business are obviously the shareholders, the employees, as well as the community at large, and we have a responsibility to ensure that as far as possible we maintain employment, as far as possible we are a respectable and up-standing member of the community, so there is a speed at which change is possible and a speed at which change is advisable.

Lord Gregson

584. There is a very good example of course and that was direct insurance and that spread like wild fire. The people who decided not to go with them in effect have now pretty well gone out of that business, so you cannot, can you, say that you, NatWest, will do this because you have to face up to your competitors who will do it and do you down at the

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[3] By far the larger of our two interactive TV trials is that with BT in Colchester and Ipswich where over 2000 homes are able to receive a range of broadband interactive services—in addition to home banking, there is home shopping, home entertainment, home education and local information. The most popular element of that part of our service aimed at our current account customers is balance enquiry and statement requests although customers are using all elements of the service. As regards that part of our service aimed at all triallists, the most popular services are loan quotations and foreign currency rates. Usage of our service is high throughout the day and evening, with no unusual or unexpected peaks and troughs. The feedback from users is very positive. We are currently undertaking more formal research to understand user reaction and needs more fully, as well as the costs of providing such a service to a much wider audience. At this stage, it is too early to assess whether there is a public demand for this type of service which can be satisfied in a cost-effective manner.

Lord Gregson *contd.*]

same time? How do you protect your employees on that basis?

A. That is true. It is a two-edged sword. If NatWest, for example, were to proceed with the complete closure of all its branches—and I am not saying we would do that—that would lead us open to attack from mainstream competition which will advertise they still operate a personal service on the high street. So you are right, competition is a brake. On the other hand, all of the major banks are in exactly the same position and indeed the building societies too. We are all faced with a large branch network which is not necessarily the way we would operate if we were starting from a clean sheet of paper. The other thing to bear in mind is that our branches serve not just personal customers, they do serve commercial customers as well who still have a greater reliance upon that branch network for cash to be paid in, for quite high volumes of cheques to be paid in. Of course I am quite sure we could introduce systems whereby we could collect cash and cheques from those companies, but at this stage it is far more cost effective and efficient for us to maintain the branches open for those corporate clients.

Lord Hollick

585. Surely Lord Gregson is absolutely right, competition is going to drive the pace of this change? You have already highlighted to us that the credit card business has become very fragmented, surely what is going to happen is that the virtual banking organisations are going to identify and then attack the most profitable parts of your business, then will offer services electronically, and you will see new players coming into the market (or at least players established in other countries) who will not have the burden, shall we say, of a network. So you will have to move at the pace of the competition or, alternatively, move even faster and run the risk of cannibalising yourself. Looking at your IT development and Highway development over the next five years, how do you address those issues?

A. The points you make are very valid, they are absolutely right. What is not yet certain is the extent to which consumers are prepared to transfer all their financial needs to a new provider; there is a pace of adoption of the new technology in this area. Certainly new entrants have come in and picked off niches—direct line insurance does not offer a universal or global insurance service, it actively selects the facilities it is prepared to underwrite risk for; Marks & Spencer is very selective in the areas it has gone into; Virgin as well. We still offer a universal service. What our experiments are designed to do is to test the consumer demand for these emerging technologies, to give us a greater understanding of customer behaviour and then it is up to us to decide how fast we want to move.

Lord Gregson

586. But if other people have done the cherry-picking, you will be left with a right bag of worms, will you not? Certainly not profitable anyway.

A. May I take that as a rhetorical question?

Baroness Hogg

587. There is one potential counter-balancing advantage for you on the new networks. Where there are issues of authentication, and not just pure authentication but concern or complexity of search mechanisms and finding a whole range of unfamiliar names, a big name, a name in which consumers may have confidence, may be able to do a publishing and packaging function on the Superhighway that could give it some form of competitive advantage. Is this realistic? You have been talking as if "disintermediation" was the inevitable consequence of digitisation and Superhighways. What I have just put forward, if you like, is a slightly different picture showing the importance of publishing and packaging information.

A. I would agree with that. I think banks could undertake a role whereby we were accrediting other organisations, other companies, not necessarily just financial ones. The consumer will look for brand names they can trust and brand names they recognise, and I think banks are still held in some sort of regard in that respect; they are durable, secure, trustworthy and reliable.

Lord Gregson

588. That is what I call a bag of worms!

A. Thank you! I am sure we could undertake a role which accredited less well-known, smaller institutions, on the Internet or any open system.

Chairman

589. That would be a service which these other institutions would pay for, presumably?

A. Ideally, yes.

Lord Flowers

590. You say in your written evidence that Government—and you add this Committee too—should be prepared to accept information exclusively in electronic format. It is the word "exclusively" I am chucking at you. That seems to me a question of the "haves" forcing the haveness on the "have nots", and I just wondered whether you would like to say a few words on that, because it does not seem to tie in quite with what you have been saying to us today?

A. I think some of our responses were perhaps a little provocative to try and broaden the debate out a little! I maintain that there is no reason why submissions could not be entirely and exclusively in electronic format. Government can encourage the use of these emerging channels and technologies by setting standards, by leading by example.

Baroness Hogg

591. Are you in danger of confusing two uses of the word "exclusively"? Is what you are arguing for that the Government should be prepared to accept information transmitted in electronic form without any kind of hard copy back-up, which is one proposition, or that they should refuse to accept

Baroness Hogg *contd.*]

information which is not in electronic form, therefore ruling out alternative methods? These are two propositions and I am not sure which you are advancing.

A. It could be either. I think ideally it should be sufficient to send an electronic version, leaving it to the recipient or the sender to decide whether or not to maintain a hard copy back-up.

Lord Flowers

592. But what are dear old gentlemen with walking sticks and no computers going to do?

A. That would depend on the degree to which input is sought from dear old gentlemen with walking sticks. If you are seeking input from corporations, public bodies, local government, I would venture to suggest they would have access to electronic methods. Clearly where people do not have access to these channels, then input in traditional paper format must be acceptable.

Baroness Hogg

593. That is my point, the distinction between saying it is sufficient to send these electronically and saying it is necessary to send these electronically. To say it is sufficient because it saves you having the back-up on paper is one thing, but to say it is necessary runs into the problems which Lord Flowers expressed of the dear old gentlemen, or ladies.

A. But increasingly I think there is becoming almost universal access to PCs.

Lord Flowers

594. No way!

A. I can only point to some research material which suggests that 80 per cent of the population have access to a PC either at home or work, or maybe in public libraries. That figure, I must say, I thought was rather high but the figure is certainly not decreasing, the figure is rising.[4]

Lord Gregson

595. But 60 per cent of them would not know what to do with it if they saw it! Everybody has got access. If there is one computer available in a public library in London, everybody has access, but it does not mean they are capable of being able to do anything with it.

A. That is true.

596. It is a comparatively small community which really has the expertise; comparatively.

A. Yes. I am not in possession of the full details but I think everybody who works in an office now has access.

Lord Gregson] Not everybody.

Lord Hollick] Are there not some important legal issues involved here? The Stock Exchange, for instance, is introducing CREST—

Lord Gregson] When! Please, when!

Lord Hollick

597. Shortly, I believe! You may say it is an ideal area for a paperless transaction system, but I believe they have indeed said they will have paper alongside the electronic system. One of the reasons for this is old gentlemen with sticks who want to have a piece of paper showing they do own some shares in this company, but another reason is that for legal processes it is necessary to have copy as proof of ownership. So are there not some quite important legal issues involved in having a paper copy of the transaction which at least one or both parties of the transaction will need for future proof for the tax authorities?

A. Yes, you are absolutely right, and I was hinting at that when I referred to the Consumer Credit Act in our written submission. There is no doubt that most of the laws almost exclusively refer to "the proper execution of documents", ie there is a paper copy with a signature in permanent ink and refer to "addresses" for notices to be served. Clearly those Acts were formulated before the advent of current technologies. It is certainly a question that has been taxing my mind as to whether or not in the bank we could serve a default notice, for example, via electronic mail and whether that would constitute sufficient serving of a notice within the terms of the Consumer Credit Act. It probably would not. You are then left with two choices. Do we wait for case law to decide whether or not it is acceptable, or is it symptomatic of a much more widespread difficulty, and that is the whole of our case laws are based upon physical hard copies?

Lord Gregson

598. Certainly you will need proof of delivery; in writing and proof of delivery.

A. Yes.

599. So you have to have electronic means of delivery, which is a difficult thing to conceive actually.

A. It might be difficult to get our heads around it. Certainly I have that problem myself, but it is not impossible to get confirmation in electronic format that a message you have sent has been received.

600. By that person?

A. By that person. So we are back to authentication of the parties on the line and security of data.

Lord Gregson] So if in debt, switch the computer off!

Baroness Hogg] Like don't answer the door to the postman! The same principle!

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[4] —22% of UK homes have a PC.
—penetration in households with families is 35%.
—48% use a PC at their workplace.
—use at the workplace is much more pronounced (77%) amongst those with household income >£35K p.a.

Chairman

601. Does this sort of thing imply a need for standardisation of electronic format? Is there a role for Government there?

A. There is a danger that Government can step in too quickly and say, "These are the standards" particularly in these fast-moving areas. But, equally, I think there is a need for Government to recognise when *de facto* standards have emerged and then to persuade by their own example individuals or companies to use those standards. If I could draw an analogy here with BT's current position, and I know you heard from Rupert Gavin last week. When the laws governing, as I understand it, BT's delivery of services, the sort of services they could deliver, were framed, the technology which is now available to BT to deliver services in Colchester and Ipswich was just not available, it was not even thought of, and then we come along to 1995 and BT can do this. At that point, the regulators are faced with a difficult decision. Is the Act or the legal restriction upon BT to be interpreted strictly, or should it be interpreted flexibly in the light of what is the new position? It seems to me there is a danger that any artificial restriction could hold back activity which may be of benefit to UK plc. So the Government needs to tread carefully in terms of being able to change that legislation if it is in place to recognise that the technology has brought about new ways of doing things, or to allow flexible interpretation of that legislation. I am not sure how that could be achieved easily.

Lord Gregson

602. What you are saying is technology is moving faster than the bureaucrats can think?

A. Perhaps not faster than they can think, faster than they can act.

Baroness Hogg

603. Is there not a distinction between a case where restriction is imposed for reasons of competition policy—you can debate whether rightly or wrongly imposed—and the sort of issues we are talking about here, which are to do with legal contracts and security in dealings between individuals and society? I share your doubts, I think one should hesitate before rushing in but if there were to be changes in the law then presumably those changes would have to define the territory of acceptable electronic transmission and authentication for the purposes of the courts? Or are you saying it is better to take case law a bit further before you move to primary legislation?

A. I must admit I am not sure of my ground here, as to which is easier or preferable. But there is a danger if NatWest must wait for case law to decide whether or not serving an electronic notice is acceptable, we may not move as fast as may be appropriate into the new electronic channels.

Lord Gregson

604. You could, of course, do it the other way around and present a case yourselves?

A. Yes, we could.

Lord Gregson] Judicial review, in fact.

Chairman

605. I am afraid that time, as usual, has caught up with us, so would you like to make one final concluding statement?

A. Thank you, my Lord Chairman. I would like to state that NatWest or banks generally have a key role to play in these areas. We understand the payment system without which commerce cannot flourish. We understand security, indeed it is the very essence of our durability, that we have managed to maintain confidentiality and security, so we are well aware of some of the major areas concerning electronic commerce. Just to reinforce what I said earlier, NatWest is keen to ensure we do protect confidentiality and privacy of data, but in a manner which will allow electronic commerce to flourish. Thank you.

Chairman] Thank you very much for some very frank and helpful evidence.

Memorandum by the National Association of Citizens Advice Bureaux (NACAB)

SUMMARY

The CAB Service believes the information superhighway has a major role to play in the development of advice and information services in the UK, offers real opportunities to the CAB Service for improving current methods of advice-giving, and also for innovation in service delivery. The use of such IT by CABx makes a significant contribution to sharing the benefits of IT within disadvantaged groups. However, issues about costs, universal service, accessibility and reliability of information need tackling.

1. THE CAB SERVICE

1.1 The CAB Service started in 1939 as a means of helping people cope with the consequences of war. There are now almost 800 main CABx and over 1,100 other CAB outlets in most cities, towns and villages in the UK. The mission of the Service is:—

- to ensure that individuals do not suffer through lack of knowledge of their rights and responsibilities or of the services available to them or through an inability to express their needs effectively; and equally
- to exercise a responsible influence on the development of social policies and services, both locally and nationally.

1.2 It is an open access service available to all, and provides free, confidential, impartial and indepedent advice. It is run largely by volunteers: there were 16,000 volunteer advice workers in 1995–96. Most of the problems dealt with are about social security, employment, debt, consumer and housing. In 1994–95, 5.5 million people brought nearly 7 million problems to CABx.

1.3 Each CAB is an autonomous organisation with full legal responsibilities. Bureaux have formed themselves into two Associations: the National Association of Citizens Advice Bureaux covering bureaux in England, Wales and Northern Ireland, and Citizens Advice Scotland (CAS), covering bureaux in Scotland. CABx are individual members of the Associations: their role is to work directly with the public. The Associations' paid staff provide support services to bureaux (information, training, development grants, support in funding applications, help with recruitment, and a quality assurance scheme), speak to government and other national institutions on behalf of bureaux, and provide, through a democratic process, direction and policy for the whole Service.

1.4 Key service issues for the future are:—

- *heavy demand for advice services:* Bureaux cannot cope with the level of demand. Waiting rooms are often full. Many clients wait for over an hour before they are seen. Telephone lines are often engaged: some bureaux record over 70 per cent of calls "ineffective" because of congestion; over 80 per cent of the public's complaints to NACAB's Chief Executive are about engaged telephone lines. In 1971, the CAB Service dealt with a total of 1.5 million queries. The number had grown to 5.5 million in 1984 and almost 7 million in 1994–95. There is massive unmet demand.
- *greater complexity of client problems:* Bureau workers are spending more time with each client. The problems brought to bureaux require advanced casework, involving negotiation with outside organisations and representation in courts and tribunals, rather than simple signposting and information provision. A survey in Manchester for example found the average debt case took 18 hours of work.
- *resource problems:* Coping with growing demand and complexity is made difficult by the shortage of resources. The principle of free provision does not allow income to be generated from clients: the Service is dependent largely on grants. While increasing considerably, the grants have not kept pace with demand. We cannot train enough volunteers, provide the in-depth information needed, fund the core paid staff to support volunteers, or provide adequate premises. Nor is it easy to find resources to innovate.
- *communication within the CAB service:* The wide dispersal of CABx inhibits communication. This had led to problems of cohesion in a network of this scale. The passing of information across the network is slow and difficult and largely paper-based. Bureaux find it hard to share information and ideas, and NACAB and CAS are constrained in the ways they can deliver their own services and receive feedback from bureaux.

2. Exploiting the Potential of the Superhighway

2.1 The CAB Service believes the information superhighway provides opportunities for dealing with these issues: the focus has to be on how far it can help us to delivery a quality service to the public. A number of CABx have run experimental projects already. The National Association itself has plans to develop a presence on the Internet. Over the medium-term we have developed a vision and strategy for the use of information technology and are applying to the Millennium Commission to fund implementation. (A summary of the report by the Solon Consultants, *An information strategy for Citizens Advice Bureaux, 1996–2000,* is attached).

2.2 The potentialities of the superhighway for improving information and advice services can be considered under two headings:—

2.2.1 developing innovatory services, especially direct access by members of the public to the information they need

2.2.2 allowing improvements in quality and quantity, to the traditional forms of advice work done by CAB advisers

3. INNOVATORY SERVICES

3.1 The technology is developing fast and the advice world is learning about its applications on an increasing scale. It is therefore impossible to say now what the potentialities for innovation really are, and what the outcome in terms of public service will be. An important task for the CAB Service is to undertake enough investment in people and infrastructure to allow those potentialities to be grasped.

3.2 The innovatory projects developed so far mainly concern *direct public access to on-line information.* These are the superhighway equivalent of the waiting room leaflet! Bureaux in Leeds, Cambridge and Manchester are involved. Such systems are becoming widespread and are well-known to the Committee. It is worth reporting some key issues arising from CAB experience so far.

3.3 Information can take at least three forms:—

- about the CAB Service itself (telephone numbers and addresses of local bureaux, opening hours etc). Besides meeting a public information need, the CAB Service can promote itself and advertise for volunteers.
- about the law, involving people's rights and responsibilities, for example, benefit entitlement.
- about public policy issues that the CAB Service, on behalf of its clients, holds a view, and wishes to publicise.

3.4 The need for non-domestic terminals. "Only a minority of citizens have internet access, and an informed guess suggests that few CAB clients are among them—or could afford to be. Issues of internet access for deprived groups in society will need to be addressed. A terminal in every home may not be feasible, but provision of publicly-accessible terminals will be needed, particularly in deprived areas; "access" here has to include affordability as well as availability. We must ensure that individuals without access to the internet are not further disadvantaged in their ability to participate equally in society". (Richard Norton, Manager, Leeds CAB).

3.5 The value of direct access information is limited: people often need further help. Commenting on the location of terminals (of the Cambridge On-Line City Project) in CAB waiting rooms, the manager, Chloe Cockerill says "most importantly for anyone who needs further help, explanation or advice, CAB trained advisers are on hand to follow an individual person's problem through with them as appropriate. This can lead on to complex negotiations with creditors or employers or representation at tribunals, services which more straightforward information providers such as libraries are unable to provide".

3.6 The importance of the overall package of information on offer. Working with other agencies, including the local authority, maximises the chances of providing approriate, high quality information which meets a range of needs.

3.7 Voluntary bodies, such as the CAB Service, are trusted by the public in a way which, sadly, government institutions, locally and nationally are not. They have a reputation for providing independent, unbiased information. Their involvement in the development of public access on-line information systems seems vital.

3.8 The superhighway allows for the development of large databases provided by large national organisations. These have their place. "However the importance of local control of information in a global context of Internet and WWW is not to be underestimated. People may enjoy (!) browsing the Web on a global basis, but they conduct their daily lives and most of their day-to-day interactions on a predominantly local basis, and it is this context that needs to be responsible to local interests and requirements if use of new technologies are to be effectively encourage and promoted". (Contributor to Manchester Community Information Network).

3.9 Possible future innovations in service which have been discussed are:

3.9.1 Using video-conferencing facilities to overcome distance. "I see the development of a CABx 'broadcasting service' offering face-to-face advice through regional 'channels'. Those households with PCTV's (and I guess many households will have one by the year 2000) will simply tune into the CABx channel and arrange for a fully interactive interview. For disadvantaged people without access to PCTV's in their homes, community access points would be available. In a way, this vision is an extension to the technology available within video-conferencing now". (Matt Doyle, Co-ordinator, Advice Lincs).

3.9.2 Using e-mail to access to the CAB. "In future the internet could offer an alternative to our current methods of service, which are all based on written, telephone or in-person advice-giving; an e-mail advice service is definitely feasible, but would require detailed attention to security in order to maintain proper confidentiality. (Richard Norton, Manager, Leeds CAB).

3.10 The National Association itself intends to open a site on the Internet in the near future. This involves *inter alia:*

- publishing a national bureaux directory with hyper-text links to individual bureau sites as these are developed.

— maintain a topical "poster" decribing current CAB campaigns, CAB issues eg, shortages of volunteers.

— publishing selected social policy reports or press releases.

4. IMPROVING THE SERVICE

4.1 In-depth face-to-face interviews with a trained adviser will remain the basic service of CABx. Demand for such a service outstrips supply (see para 1.4). The IT strategy for 1996–2001 identifies significant developments aimed at improving these services using the potentialities of the superhighway.

4.2 *On-line access to an enhanced national information system:* This key tool for CAB advisers about the national framework of law is now in a 70 volume, 12,000 page paper system held in each bureau and up-dated monthly by a package delivered to bureaux via the postal system. The plan is to create an on-line database of the system accessed by bureaux via ISDN lines to regional file servers. The database would be up-dated daily instead of monthly; up-dating costs of about 1.0-1.5 days a month in 1,300 outlets would be saved and released; search facility would be significantly improved. In addition, the system would be developed via the addition of caselaw from courts and tribunals, copies of the relevant statutes, interpretative and tactical material, and a range of advice tools eg calculation packages.

4.3 *Access to sources of expertise to help in complicated enquiries:* Advisers need to talk about difficult cases with experts in the relevant law. Networks of experts at local and national level, inside and outside the CAB Service would be created which the adviser could use. A prototype is the Electronic Immigration Network based in Manchester, but accessed throughout the country. A number of organisations with immigration law expertise are co-operating to provide a database of case determinations, and a bulletin board for posting information and queries about immigration, nationality and refugee issues. A similar application in London links 45 bureaux to specialist sources of help in welfare rights and money advice using Link Legaease software. This is funded by Thames Water. Easier access to expertise spreads knowledge and skills to ordinary bureau workers and this improves service to clients.

4.4 *Sharing information around the CAB network:* E-mail facilities will allow the CAB Service to communicate more effectively. Besides expertise in law and casework, managers can share information about quality control systems, bureaux can be told about training places available, statistical information can be passed to the central organisation faster. This sharing of knowledge will lead to a better services to the public.

4.5 *Improve and extend out-reach services:* In hospitals, prisons, remote rural areas etc. Using the superhighway, advisers distant from the bureau can be connected via a lap top computer to the national information system and to their parent bureau office systems. This will improve advice service to those who cannot easily travel.

4.6 *Improve telephone advice services*: by using call transfer technology to 'overspill' excess calls to 'free' CAB telephones in the local or regional area. The advent of the video phone may make telephone advice seem more attractive to clients. The enhanced on-line information system with its improved speed of search will ensure quicker response by advisers and reduce length of calls.

4.7 *Expanding training facilities*: Initially, multi-media training products would be on CD Rom. As the superhighway became more broadband, training resources could be accessed via the network. These resources include interactive modules and tutors. More training can be provided this way and the training made more effective.

4.8 *Effectiveness in organising computing facilities*: The superhighway allows us to opt for an architecture which has a number of main services linked to bureaux and NACAB via the Internet. These servers, rather than pc's within the bureaux, would hold the processing power, memory and storage which are needed. Bureaux would have network pc's with ISDN links to the server. This would be cost effective, saving bureaux the cost of pc's, maintenance, house-keeping time, up-dating time and software costs. It would sharply reduce some production and distribution costs for NACAB. Bureaux would have access to core NACAB services—information, training etc—and have their own 'spare' for local databases etc on the servers.

4.9 The superhighway is central to the IT strategy for the CAB Service, and the use of IT is central to the delivery of more and improved public services. The costs however are very significant. Some bureaux are at the leading edge, others are yet to start—12 per cent of bureaux had no pc's in 1994. The cost of development, hardware, software, network connections, training, promotion etc are beyond our normal budget. On-going costs are also considerable. The 5 year cost of implementation is about £25 million. We have asked the Millennium Commission to contribute 60 per cent of this funding.

5. SOME ISSUES

5.1 The CAB Service's proposed use of the superhighway to improve and develop services to the public raises important issues, some of which are also discussed in the National Consumer Council's recent and excellent publication, *The Information Society: Getting it right for consumers.*

5.2 *Resources*: Para 16 on the Millennium application indicates that the costs involved are very significant. For a service organisation with heavy unmet need, savings arising through the introduction of IT are absorbed in extending service rather than freeing resources to cover investment or running costs. In a volunteer service, the savings in staff time are simply not available for re-investment in IT. Moreover, CAB services are free to the consumer so there is not income flow from the users. This analysis applies to most voluntary bodies. Their resourcing dilemma is one cause of the worry that IT may increase division and inequality, as it is the disadvantaged groups who disproportionately use the services of such bodies.

Finding adequate funding to allow IT development in such bodies is a major way of ensuring the most disadvantaged groups share in and benefit from the technological change.

5.3 *Universal service in telecommunications:* OFTEL in its publication *Universal Telecommunication Services* (December 1995) makes proposals to try to ensure a universal service with respect to new telecommunication services. It defines such a service as "affordable access to basic telecommunication services for all those reasonably requesting it, regardless of where they live". The application of this principle, involves in OFTEL's view, public access points and the provision of education services to school age children. The Labour Party has widened the definition to include other social organisations, including Citizens Advice Bureaux. In its "informal" agreement with BT, the latter would link CABx to its proposed wideboard network free of charge. We would welcome a vigorous debate about the basis on which new telecommunications services are provided to organisations such as CABx.

5.4 *Accessibility:* It is widely acknowledged that we do not yet have a superhighway because carrying capacity of existing network is so limited. This is manifest in slowness of access to information: waiting times are considerable. With a distressed and worried client sitting beside them, bureau workers must have fast access to the information they need. This is why our consultants suggested ISDN lines: they would speed up enquiries considerably. Yet the current costs of BT's ISDN—£400 per connection, £84 per quarter rental plus telephone charges—makes this an expensive option.

Evidence so far suggests that the lack of computer skills and confidence hinders the use of new technologies. This is usually seen as applying to the user. However, it is also true of the provider. Designing and constructing information for the Internet requires considerable skill and expertise which many people in bureaux do not have. In the voluntary sector in particular, a key need is for the development of basic computer literacy: it is on this basis that proper exploitation of the superhighway depends.

5.5 *Reliability and verification:* Some have suggested that the CABx will be able to meet a lot of their information needs by browsing the Internet and picking up what they need. Besides being very time-consuming, this view ignores a requirement in all advice work—that the information passed on to clients is accurate. It is impossible to verify the reliability of some of the data now available. This is why the way forward for CABx is to join "closed" networks where access is limited. On such a network information will be structured to their needs, and will have a high degree of reliability.

EXECUTIVE SUMMARY

AN INFORMATION STRATEGY FOR CABX: HIGHLIGHTS

FRAMEWORK FOR CHOICE

Diversity of areas and bureaux

The areas CABx serve vary, as do CABx themselves in size, the scope of their work and their use of IT.

Closely-defined brief

Should CABx adopt advances in IT? How should they build for the future?

Extensive research

Ideas for the future come from wide research. The team listened to the opinions from more than 100 people, who work in CABx, for NACAB, or with them. Solon also fed in written replies from 729 CAB advisers, committee members, funders and managers, representing 480 bureaux.

CABx seek improvements

Bureaux want to reach more clients in vulnerable groups, to improve the chances of a positive outcome in the cases advisers handle and, equally, to enhance the Service's input to social policy.

Pressures and opportunities

CABx handle many cases, but a large, untapped demand escapes the net. The team also saw openings for multi-media products and services that would help people to avoid the problems that bring them to CABx.

Changing case load

Today, managers and advisers have to deal with a wide range of issues, and often take on tasks that require them to spend more time on a case, and apply extra effort to help the client. Franchises for legal aid will add to these pressures to extend the scope and depth of CAB work.

Stresses and strains

Phones that no-one answers, long waits to see an adviser, queues that turn away clients who cannot or will not wait, premises that are insecure and badly-designed for use by people of all skills and abilities among CAB staff and clients—bureaux often suffer from these difficulties. The strategy should enable CABx to reach those which it fails to serve.

Existing use of IT

Most CABx have fax and at least one computer, but use of IT is slow to gain momentum. Bureaux have yet to integrate IT applications, so they have separate word processors, debt management and benefit programmes.

Strengths

Track record, ability to raise funds, an established network of CABx and central support, a well structured Information System, and a powerful influence on policy.

Weaknesses

A "legacy" of older IT, doubts about IT's friendliness, poor premises and security, ad hoc and diverse approaches to IT, and concerns about raising extra large sums for IT.

Opportunities

Chance to apply new strategies using IT, to benefit from the latest advances, to integrate IT and share knowledge, and to develop new products or services.

Threats

Unmet demands, could lead to dissatisfaction among clients and funders. Problems could arise if resources prove limited and unproductive conflicts arise between CABx and NACAB.

Strategic concerns

IT advances should lead not just to higher efficiency in what CABx do now, but to a rethinking of how IT could enlarge the purposes and horizons of the Service.

Targets

Reaching more people of all abilities with better quality, wider and more intensive services; satisfying unmet demands; recruiting people in all adult age groups and training them in IT that suits the circumstances; enhancing clients' perceptions of friendly, adaptable IT; and improving support services, and the use of resources to enhance contributions to policy.

PROPOSED STRATEGY

Cascade strategy

Enable CABx to adopt elements of the strategy as they choose, to suit local demand, preferred timing and the availability of funds.

Electronic mail, bulletin boards

E-mail and bulletin boards would facilitate sharing of information for policy development, to transfer data, to send in returns, to pool experience, to gain access to expertise and knowledge.

Local databases

Databases to manage information on, for example, local cases, resources and the availability of funds, using either low-tech or high-tech IT.

Multi-media training

NACAB/Open University programme to develop multi-media training modules for use in CABx, by trainees at home, on formal courses and over networks. The modules would promote familiarity with IT.

Centres of excellence

CABx work with other bodies to set up centres of excellence in areas of value to CABx as they expand and extend the Service, within a contractual framework run by NACAB. The centres produce special modules for the Information System and training, and provide a source of advice on out-of-the-ordinary problems.

The second Phase

Development of integrated systems, centred around the Information System and the policy role of the Service. In this Phase the Service would extend the centres of excellence and CABx would help to develop specialist systems and software.

Telephone call referrals

In phase two, a contractor would introduce a telephone call referral service, working in close harmony with CABx.

Phase three

Using case records as an information resource for analysis and appraisal; introducing facilities that give clients direct access to CAB guidance; and new ventures to seize opportunities in the UK and beyond.

Infrastructure

Key elements include IT that will allow managers and advisers to give dictation to computers; standards that help CABx to work together and avoid IT obsolescence; systems to manage documents and databases; and integrated systems to replace separate applications of IT.

Fulfilling targets

Increased capacity, greater flexibility, building knowledge resources; preventive work; and generating more funds to apply to the clients' benefit.

Information System

CABx have a high regard for the Information System, but see a need for it to cover more ground, and perhaps to lead into, for example, the sources of law, forms and standard letters. Publishers engaged in similar projects have shown a way forward. They replace in-house work with external contracts to develop, extend and enhance their products and services; Solon recommends a similar approach to NACAB.

Integrated applications

Survey respondents usefully categorise IT applications and functions in six clusters—

- "Core services" (including the Information System, membership circulars, statistical returns, social policy submissions, electronic mail and bulletin boards);
- Law databases and litigation support;
- Multi-media training;
- Special applications (for example, debt management and benefits programs);
- Administrative systems;
- Local databases.

Support and maintenance

Solon recommends that CABx should come to rely on shared resources they can use in common—systems that will be more economic to maintain and support, and which will give bureaux benefits of scale.

Strategies

The strategic dimension of IT should prompt a fresh appraisal of the Service's corporate strategies.

IT ARCHITECTURE

Proposed configuration

At the heart of the architecture would be a main server, linked to CABx and NACAB using Internet. However, only bureaux and NACAB staff would have access to the system using high-speed telecommunications from local PCs or workstations.

NACAB and the CABx would form a "closed" group, an "Intranet".

CABx would have a cumulating mix of facilities, that would include—

- E-mail and bulletin boards for social policy, statistical returns and communications purposes;
- Access to recognition software tuned to the voices of individual members of staff and volunteers;
- The latest software that (from phase two onwards) will allow integrated applications;
- Confidential case and other information on file, securely protected for each CAB's own use;
- As available, information accessible to all CABx including NACAB's Information System, the additional modules, training materials, NACAB's membership circulars, etc.

Functions

Integrated software to master and manage documents and databases, and respond to the CABx' principal IT needs.

Administration and support

User-friendly screens on CABx' workstations or PCs that, with computer-based dictation, should encourage advisers and managers of all age groups and diverse perspectives to take advantage of the resource.

Development of the system

The Service will require a development programme that will include adding tags and links that make it easy to organise the information and browse through it. Interconnection of main servers for CABx in each region and a special type of telecommunications network, called ISDN (an integrated services digital network) would provide speed, reliability and security.

IMPLEMENTATION

Preliminary tasks

At the outset, Solon believes NACAB and CABx should spend enough time gaining familiarity with the policy, and discussing its implications. The team recommends using NACAB's membership circulars as a basis for a prototype development.

To complement these early steps, demonstration of typical systems would help, and NACAB and CABx would require initial work on a functional specification, invitations to tender and detailed plans for phase one.

In parallel, Solon advocates surveys of funders and clients to prepare the way for the three-phase implementation programme. Negotiations would begin with funders at this time.

Phase one 1996–97

Evaluating bids for the proposed work and negotiating contracts would lead to tagging and linking NACAB's Information System, and the piloting of the centre of excellence idea, training modules, and a telephone referral service.

Phase one developments would focus closely on the social policy functions of the Service, and the value of electronic mail and bulletin boards to its evolution. Development work would proceed on central support and CABx systems.

Managing the contracts, evaluating progress and drawing up detailed plans for phase two would follow.

Phase two 1997–98

Further contracts would lead to the Information System being placed online, to new centres of excellence, the introduction of new products and services.

The programme would include work to enhance and extend the central support, CABx and centre of excellence systems.

Managing the contracts, evaluating progress and drawing up detailed plans for phase three would follow.

Phase three 1999–2000

To capitalise on the work to date, NACAB and CABx would introduce outreach services, joint ventures with publishers and others, a version of the Information System directly accessible by clients, and experiments with videophone services.

Costs and funding

Adoption of IT

Solon has carefully estimated the rate at which CABx are likely to innovate, and the directions they will probably take. However, the forecasts are not precise but fall within a range of uncertainty, and would spread over five years.

CAB Forum and CABNet

Costs of creating a CAB telecommunications network (the "Intranet") represent one major outlay, that includes voice dictation, interfaces, workstations and PCs, software, laptop computers, peripherals, consumables and security.

Centres

The proposed centres of excellence will require access to CABNet, purchases of intellectual properties, investment in Information System and training modules, and advice services. The centres will incur overheads, and expenditures on premises and security.

Central support

Central support for CABNet will include the main servers, support services, a programme of technical development, and telephone call management services. The central support function will incur overheads, and expenditures on premises and security.

New ventures

Opportunities in electronic publishing, in new client-led services and software development will require some capital, but should begin to earn substantial revenues in the early 2000s.

Funding

NACAB hopes to raise about 50–60 per cent of the funding from the Millennium Fund or the European Union. The balance would come in equal amounts from, on the one hand, national and regional sources and, on the other, from fund raising by CABx to support the Service in their localities. Solon recommends a survey of funders to identify the "triggers" of support, and the use of fund-raising experts to advise NACAB and CABx on ways to attain a step function in the Service's finances.

Examination of witnesses

Dr E Craven, Director, IT Strategy and Mr B Garlick, Manager, Computer Unit for Bureau Support, National Association of Citizens Advice Bureaux, called in and examined.

Chairman

606. Dr Craven, welcome to this hearing. Thank you very much for coming. Perhaps you would like to begin by introducing yourself and your colleague, Mr Garlick, to whom welcome also, and then make whatever introductory statement you feel appropriate?

(*Dr Craven*) Thank you, my Lord Chairman, very much. May I say, first of all, how glad we are to be here to help the Committee in its work, and we are glad to have had the invitation. My name is Ted Craven, and I am a Director at the National Association of Citizens Advice Bureaux, and I look after Central Bureaux Services, which delivers support services to bureaux. Mr Garlick is the manager of our Computer Unit for Bureau Support which is based in Swindon, and delivers computer support to our Citizens Advice Bureaux up and down the country. If I may, I would like to say a few words, my Lord Chairman, to say how we are approaching this issue. We, like many voluntary organisations, are fairly much in the same place. We are looking at the Superhighway and what it can offer and scratching our heads like a lot of people and saying, "Where is it going, what is it going to do, how will it fit in, will it help us do our job better?" Like a lot of people we are not clear what it is going to be able to do, but what we do know is that we want to be a player in the game, as we see it as something very important for us. We need to get our own act together, we need to talk to other people and we need to be ready to grasp the opportunities, whatever they might be, when they do emerge. In our written evidence I have tried to set out where we are currently; I have tried to explain in the written evidence the kind of experiments local bureaux are doing with direct access to local databases for members of the public. A number of our bureaux are involved in such schemes, in Cambridge and Manchester and other places, working with other organisations. I also explain in the written evidence the strategy we have for the next ten years which tries to set out where we want to go. The heart of that strategy is linking all the Citizens Advice Bureaux together and to the National Association, so we can speak to one another, and using the potentialities that that linkage creates to improve our services and extend them. So the Superhighway concept is at the heart of our strategy for the next ten years. I do not want to go over that but I want to deal with a few issues before we open up, and to explain what value-added the Citizens Advice Bureaux can bring from getting involved in the Superhighway and all the developments associated with it. I think the first thing the Citizens Advice Bureaux can bring is the confidence and reputation that we have amongst the British people. All the surveys we do and all the evidence and feedback we get is that people use and value us as a free, confidential, independent service. People trust us to provide unbiased and accurate information. So we bring that kind of reputation. We have 5 million people who use us every year, and they bring us about 7 million problems. A survey we did in the early 1990s suggested that 1:4 of the adult population had used the Citizens Advice Bureaux sometime in their lives, so we are embedded in the fabric of British society, so to speak. The second thing that we can bring in terms of value-added is that our clients on the whole are what we would term the have nots, who might be left behind in the information society. On the whole, although this is not invariable, the people who use us are largely poor, troubled, distressed, fallen on hard times, and they come to us for advice and information. So we have the confidence of the have nots, and that is the client group that uses us a very great deal. I think Citizens Advice Bureaux getting involved in the Superhighway means we can bring them aboard to some degree. The third thing we bring is that as a national association we have 1,800 outlets in almost every community in the land. Almost every village and every town has a CAB. So we have a national coverage where everybody has access to us. Finally, what does the CAB Service need in order to play a role in the Superhighway? There are a number of things. First of all, you will not be surprised to hear that we need resources. We are a voluntary body, we do not charge for our services, we have no flow of income, we rely on grants. Getting involved in the Superhighway is quite expensive in terms of capital investment and on-going costs, so there is a problem about resources for us. We were pleased that the Labour Party in its thinking about the Superhighway and its work with BT suggested that CABx ought to be one of what they called 'the social organisations' to be linked to the enhanced Superhighway when we get it. We are not particularly committed to the Labour Party or to that particular scheme but it does suggest somebody

Chairman *contd.*]

might help us to make those connections to the Superhighway which we would find quite difficult to fund ourselves. The second thing we need to do is develop awareness and knowledge inside our own organisation. We have 28,000 people working for the Citizens Advice Bureaux and there is a long way to go in developing their awareness and knowledge of what IT can offer, so we have a lot of work to do just moving those people on, helping them to get involved, so it does not become a top-down process which is imposed on people. It should grow up out of the people in the Bureaux themselves. So there is a lot of work to do on awareness and knowledge. I think we also need some kind of common agreed plan and strategy for how we are going to move forward. We have partly developed that now. I mentioned earlier in our evidence that we had a consultancy last year which helped us develop that strategy. I think that will guide where we are going and I think that will give a basis for people to know what is going to be happening and for getting involved with us. We also need co-operation from other organisations. We need to work with other voluntary bodies and we need to work with local authorities: this is the way you can get something really useful done. Finally, I think we need to develop a voice in the discussions about how the Superhighway is going to go. I realise up to the present time we have not really had a voice. I think we need to develop it because a lot of decisions are being made by a lot of people about how the Superhighway should and should not be run. We need a voice, either directly ourselves or through organisations such as the NCVO or the NCC, as a contribution to that debate. My Lord Chairman, those are the things I would like to say initially. We are excited at the opportunities the Information Superhighway offers. We are eager to get involved, and we have made a start, but we see ourselves getting significantly more involved in this over the next ten years.

607. Do you have a major problem with the training of your staff in these new technologies?

(*Dr Craven*) Yes, I think we do. Barry will be able to say more about this. His unit offers a range of services to bureaux: it has got a telephone consultancy; it offers guidance about things like security and it also offers training. The one thing that we cannot do is to meet the demand for training. Bureaux are saying, "Please come in and please train our workers, develop confidence in our workers. Please come in and train us as managers about how to think about our organisation, about how to introduce IT into it." So there is a massive training need generally both in terms of raising awareness and then in terms of specific applications that we might want to make. I think we know what sort of training we want to do. The question is actually getting the resources. We also know that our bureaux want it. We have got a resource gap that we need to bridge there. Barry, do you want to say more about training?

(*Mr Garlick*) My unit was only set up by NACAB two years ago. This was our first major move in providing information technology support to our bureaux. In a sense, being a new unit we had to define an agenda for that. What has become clear to me as the manager of the unit over the past two years is that awareness and confidence in using technology amongst the 28,000 people that my colleague was talking about is the big issue. Training is a problem because all of our budget is spent on training advisers in giving advice to clients. Now we need to superimpose on that training in using the technology to actually participate in the developments that this Committee is dealing with. There is no budget to do that, of course, so there is a barrier there.

Lord Flowers

608. Dr Craven said that the Citizens Advice Bureau had to develop a voice to help determine the way the Internet and Superhighway developed. The question is a voice in what forum? The Internet is already globally controlled—or uncontrolled, if you prefer, but anyway it is global. I wonder, therefore, where you feel you are going to exert your voice when you have got one?

(*Dr Craven*) I cannot give a precise answer to that in the sense of actually knowing enough about the way these things are done. I think the way forward for an organisation such as ours is to work with other voluntary bodies and work through umbrella bodies such as the NCVO and the NCC. You will have seen the report that the NCC produced a couple of weeks ago about the Information Superhighway. They are involved in forums in this country. They have links with OFTEL and they have links in Europe. I would like to see us working with an organisation like that or with the NCVO (National Council for Voluntary Organisations) in order to get our voice heard. It may well be that that is the best way of doing it rather than trying to operate ourselves. The reason I raised that was because I feel that we have got a legitimate input into the way the thing develops. I am not sure at the moment how we actually make our voice heard in that.

(*Mr Garlick*) I was reading in the *Telegraph* this morning an article called "Wired Island". We are becoming aware of a number of community-based initiatives and developments in which different participants in the community are forming together to provide a range of information services to that community. CAB is involved in just one or two of those initiatives but is not involved in the others to the extent that one would hope, and so I have a feeling that some of these initiatives may be based on business rather than some of the other services and perhaps we ought to have a louder voice in influencing the direction of the information and the information content provided within them.

Lord Gregson

609. The thing that worries me is the lack of recognition that the have nots are the cannots as well. The idea, for instance, of putting computer booths at telephone kiosks raises the idea that most of these people, like many of your voluntary staff and so forth, are cannots. Is the booth going to be useful? Do you not have a very special role in this situation because besides relating to questions that come in to you from the general public, you also have a role in

Lord Gregson *contd.*]

interpreting government papers right across the board? What worries me to some extent is you have to recognise that you are the cannots in the population, and there are a lot of them at this point in time. The younger end are being catered for by a concentration on education, the use of computers and so forth, but the other end are not being looked at at all. You are, in my opinion, one of the most essential organisations in dealing with this. You have got a large job on your hands in that you have a lot of training to do because I know a lot of CAB people locally and they rank amongst the cannots as far as I am concerned. You are going to have to start from scratch in many ways. This is a major, major problem. You stand in the position of being the only organisation that can help to solve it. Do you recognise that as a national role?

(*Dr Craven*) Indeed. One fact I did not mention about the CAB service is that we are on the whole a volunteer service. There are a growing number of paid workers but largely we are a volunteer service. We have a fairly large turnover of volunteer staff. People come in and work for a little while and then they go out again and return to a job or whatever else they were going to do. We "lose" about 4,000 or 5,000 people each year. That is a great cost to us because we have got to train those people and we do not take into account the fact that they may only be with us for a year or two years. In the past we have trained those people and put a pool of skills and knowledge back into the community. There is a constant flow of people through the organisation who go out at the far end of it with more skills and knowledge than they started off with. In terms of the training that we are talking about, computer training and computer literacy it will become part of the training that we do for those volunteers who move through our service. So I think that is one role that we can play. We are not in business to train volunteers. It is only a means to an end. One of the outputs is that we would be putting back into the community people who would change perhaps from being cannots. In a sense you were pointing out some of the limits to the Information Superhighway in terms of people's capacity to get what they want from going to a kiosk and punching their requirements into it. I think there is tremendous potential there for people to do that.

610. If you have just have left school, yes.

(*Dr Craven*) For the wide cross-section of people. It seems to me that by direct access to well-designed information a lot of people could meet their needs for information, but there are limits to that. I mention in my paper that the manager of the Cambridge bureau was talking about having a couple of terminals in her waiting room and one of the advantages of having it in the CAB waiting room is people can get some information from it, but then they can say, "That's not enough. I now need to talk to somebody about this." You get into a distinction between information which you can get from a database that does not talk to you, and advice which you can get from a person dealing with your problem/in the round and interpreting the law for you or writing a letter for you, or introducing you to somebody or negotiating for you or whatever it might be. What we would say is that there is tremendous capacity to exploit the potential for direct access by members of the public to these information sources. I think we have a role to play in developing them and giving people access to them. However we do recognise the limits of that form of service.

611. Eventually, of course, you are going to be entirely dependent on your databases for providing information, whether it is the written word or electronic. Shortly it will only be electronic, in which case you either go out of existence or you join the IT community, so it is absolutely fundamental to your future. At this point in time I doubt if there are enough electronic databases to serve your requirements. I doubt whether you could do away with all your written word, if you like, and sit down with a computer and get the information that you are presently providing to the public. So you have a major problem of lack of databases, do you not?

(*Dr Craven*) Indeed, and this was one of the things that exercised the minds of the consultants that we have had looking at our organisation and how we should operate. Currently the database that the bureaux use in advising the public is a 70 volume paper system which everybody holds and a lot of my staff spend their time updating that system every month and sending things through the post and then people spend two days in the bureau adding the information to the database to make it up-to-date. That is the way we have got it at the moment. You are right, I think the days of delivering it in that form are numbered now. I think one can see the thing coming to an end. In terms of the point you are making about us not having enough databases, I think a really key thing is that if we can computerise that database and make that available on-line to the bureaux we have made a major step forward because the job of my staff is to tap into all the databases and draw out what the bureaux need, put it into a form they can use and then send it down the line to them. So we are getting hold of the information, we are structuring it and we are making it available to the bureaux so they can use it in an effective way. I think doing that on-line system rather than a paper system will make it a much more effective tool.

612. Do government departments not have a duty to provide a database of their activities, like the Department of Social Security? In America with the Freedom of Information Act they have got to. If they do not have it then they are in serious trouble.

(*Dr Craven*) If you look at our database currently, for a large part of it we use the information that is produced by government departments in the form of leaflets and booklets and things of that kind. We do not write it all again, we simply use it as it is. If the government has produced a wonderful leaflet about Social Security then we simply make that part of the information system. What we want to do is to enhance it by adding access to statute and to all the case law coming out of the courts and the tribunals.

613. All the information on case law is going to be electronic anyway, if it is not already electronic, so there is no problem there. How do you tap into it?

Lord Gregson *contd.*]

(*Dr Craven*) You can make it electronic. The key thing is to make it accessible to the workers when they need it in a form that they can use.

614. Can they not do it direct?
(*Dr Craven*) What do you mean by "direct"?

615. The information exists electronically already on case law. Why can your individual bureau not tap into that information direct? Why do you have to interpret it? You might fall flat on your face interpreting it.
(*Mr Garlick*) I suppose the essential difference between the CAB database and the electronic version of the 70 volume system is that it translates legislation into forms which we hope are digestible to our bureaux volunteers. A very small number of bureaux at the moment are already tapping into some of these other databases. That assumes that they have developed the technical skills and the confidence to do that and then it is down to them to do the translation themselves. That is happening. It will continue to happen. The problem at the moment is that it is only available to a few bureaux who have passed this confidence barrier.

616. Is that not a thought for the future? It is the way it is going to go.
(*Mr Garlick*) It is starting to happen.

Lord Butterworth

617. You have given a very graphic description of how the CAB works because you began by saying that what you did was to deliver free and accurate information, but it is much more complex than that, is it not? What you are now saying is the delivery of information as such is not enough because mostly the have nots need advice and need to talk the problem over and then your chap in Cambridge goes even further and says a lot of the work is concerned with not merely giving advice, not merely giving help, but actually undertaking activities, drawing up documents, putting in appearances before tribunals. I am left wondering how much of this essential service needs the volunteer and how much it can be reduced by databases in computers even if your clients can use the computer. Is it clear that this is primarily the way to reduce the burden to make it possible to continue to give advice where it is needed?
(*Dr Craven*) This is something that is exercising us at the moment. At one point in the past the Citizens Advice Bureaux were mainly information providers. People came in for simple pieces of information and they were provided with them by the adviser. I think those days have long gone. They do not do that any more. People on the whole do not come in for very simple pieces of information. One reason they do not do that is because they can get it somewhere else and another is because people will not wait an hour in a waiting room for a simple piece of information. They wait for an hour if they have got some sort of crisis on their hands and they need to see somebody and get something sorted out quickly. We know from the surveys we have done that about eight per cent of the work we do is what we call simple information and signposting where somebody would come in and receive a simple piece of information or be told where they can get it. Something in the region of two-thirds of what we do is advice, where there is a need to sit down with the client and to take the peculiarities of that particular client's case, to interpret the law for them, to help them write a letter, to tell them about their rights and responsibilities in dealing with government departments or other organisations, or to do a benefit calculation for them if they are concerned with Social Security. You need then to have a face-to-face relationship in some kind of way. I think that is going to remain the staple of what the CAB does in the future. I cannot see that the have nots are going to need any less of that kind of service from us in the future when the Superhighway comes along. Social welfare law is extremely complex. It has not got simpler. There is always going to be the need for that. What our job is to do is to try to see where we can draw the boundary between information and advice so we can actually find out how we can use electronic databases. We do not know what that line is at the moment. I suspect it is more than we think it is. I think we can do more in that respect, but I think our main business over the coming ten years is going to remain person to person advice.

618. What I have at the back of my mind is your application to the Millennium Fund. I wonder whether your organisation as it is at the moment is fitted to carry out the task that you mentioned. I will tell you what I have in mind. You said that you are a national organisation and, therefore, what you want to do is to create this network. But in your document I noticed that you say, "each CAB is an autonomous organisation". Now we cannot have it both ways, can we? Are you a national organisation with branches or whatever you call them, or is each CAB an autonomous organisation? So if you organised a network then Birmingham or Carlisle can say, "We don't want it, we're not going to do it, we're autonomous". Can I be helped on this structural point?

(*Dr Craven*) I do not think you have got enough time for me to explain the intricacies of our organisation! It is very complex. I think the easiest way of seeing it is as a federation. There are a number of organisations out there who are called Citizens Advice Bureaux. In a sense they are franchisees. There is something called the CAB and in order to be called a CAB you need certain things, you need to conform to certain policies, you need to behave in certain ways and if you are doing that then you can be a member of the club and being a member of the club entitles you to call yourself a Citizens Advice Bureau. It also entitles you to a range of services, like the information service, training or a range of other services that are available. What the Citizens Advice Bureaux are not, however, are branches at the end of a hierarchy in which someone can pass an order down and say, "Next week you're going to change and behave in this kind of way." We are not that kind of organisation. We have got to work much more through persuading and influencing rather than giving instructions about the way things are done.

Lord Flowers

619. A perfect match for the Internet.

(*Dr Craven*) This goes back to the point I was making about having a strategy. One thing we have got to do is we have got to get the CABx service signed up voluntarily to say, "This is our future for the next ten years and this is the way we will go." We know that bureaux will join in the strategy at different times. Some are better resourced than others. So the Birminghams and the Manchesters can join the strategy and get all the electronic things sooner than a little bureau in a pub car park somewhere. They will have to come aboard at the end of the ten years. What we want to do is for people to say, "Yes, this is the future, we will join it when we can." If they are going to do that what that means for them is they have got to conform to certain kinds of standards and ways of behaving. If we want to deliver an on-line information service to them they have got to have certain things in their bureau in order to receive it.

Lord Butterworth

620. Can I bring you back to the Millennium application. I take it your £25 million is a guess and there is no estimate behind it. You are looking for big money. It is in fact the case, is it not, that benefactors tend to be more helpful when the client is helping himself? You suffer in a sense by saying that your advice is free. This is quite fundamental to the CAB service and very important, I understand that. I have read the kind of activity that you are now getting into, and your colleague at Cambridge describes it graphically, drawing up a will, making an application to a tribunal and so on, but if you get that kind of field and your client can afford to pay, why should he not? It seems to me it would strengthen your application to the Millennium Fund if you were seen to be helping yourselves.

(*Dr Craven*) I take your point and it would make everything very much easier if we had a flow of assured income in that kind of way. What it would be is a very fundamental change in the nature of the services that we provide.

621. As I understand it, the services you provide have already changed in nature in the sense that you are not providing information. You quite often can only be successful by providing the service.

(*Dr Craven*) Providing advice, yes. I think a large number of the people who use us and for whom our services are not just nice and useful but quite essential to their well-being would not use us if they had to pay. We would drive away a lot of the people that we would want to serve. I think it would be very very difficult for us to get into any kind of means testing operation and say, "You pay. You don't." I think that would destroy the relationship of trust between the worker and the client. However important the Superhighway is, making that change would be the tail wagging the dog. It would be making a major change in the nature of what we are in order to be able to use information technology in the Superhighway. My own view is that any change to introduce charging for our services would so fundamentally change what we were doing that I think it would be very difficult to get our members to accept it.

622. Is there any more information you would like to tell us about the progress that you are making with the Millennium application?

(*Dr Craven*) I will bring you up-to-date on where we are at on that. We got a letter from the Commission last week. As you probably know, the process of getting any Millennium money is quite a long one. There are four or five hoops you have got to go through. We applied in February at what is called the application stage, which is a 20-page document and some supporting appendices. The next stage after that is detailed appraisal and here they really crawl over your application and send their own consultants in and really do a thorough job on it. We knew when we put the application in that we had not provided enough information to the Commission about the financial and technical viability of our scheme simply because we just had not got that far down the road. However we did want to raise a flag to the Commission to say that we were interested. We got a letter back saying that there was not enough information on the application to pass it on to the next appraisal stage, which is detailed appraisal. However, the Commission did see the project having potential to meet what is called "the Millennium impact" of projects which are supported by this Commission." So the message was; "It is the kind of project we want to support, we know what you are trying to do, we do not know whether it is going to work or not." We intend to re-submit this application in September, which is the next time this can be done, and between now and then we have got some resources to develop enough information to prove the financial and technical viability of the scheme.

Baroness Hogg

623. I still find myself slightly confused about your medium-term strategy with respect to the Superhighway. You have given us a picture of moving out of the simple information business. I am interested you say that they find it easier to get this information elsewhere now. Where are they getting it from?

(*Dr Craven*) I think a large number of organisations, government departments, benefits agencies, are getting into this business of providing electronic databases for direct access for people.

624. I am sorry, but most of the people who come in to you are probably not getting it alternatively by electronic means at the moment, are they? They are getting it in a paper-based form or over the telephone.

(*Dr Craven*) There are quite a lot of organisations who are in the business of providing information to people either on paper or electronically.

625. So the government is getting better at the transmission of information?

(*Dr Craven*) Yes, straight information.

626. Because most of what you are telling people about is in some way government related. In the future when more of this becomes electronic one can see two possible roads for you: the one that you have described is moving back into the complex advisory

Baroness Hogg *contd.*]

business; the other is providing access points to electronically delivered information from government services mainly to people who will not have the hardware in their own homes, who will be at the bottom of the pile of being able to have this in their own homes or having it on their desk in the office. That is, if you like, being in the simple information business but also being in the business of providing access to that information. I am not quite sure why you do not see that as an important part of your role in the future, why you emphasise the advisory function rather than this role. You spoke earlier about wishing to have a voice in the development of electronic services. Given that this is at least an opportunity to exercise that voice, do you not have anything to say to us about how you think government should be developing its own electronic information services which may then be accessed through places like the CAB?

(*Dr Craven*) On the first point about CABs being an outlet or an access point, I hope I did not give the view that we did not think that that was sensible. There are two access points in the Citizens Advice Bureau in Cambridge. The CAB was responsible for putting only a certain amount of information onto that as the rest came from the local authority or from other organisations. That seems to me a perfectly good, sound and sensible way forward. When I talked in my introduction about co-operating with other organisations what I had in mind is that the CAB does not have to produce the whole of the information from scratch. They can work with local organisations to produce something which is very useful and has a range of information on it, not just our kind of information about benefits but also about local events *et cetera*. I think that is extremely valuable and I think that the waiting rooms of CAB are good public places where such outlets could well be. I am very interested in the evaluation of the Cambridge project, for example, to discover how popular the CAB waiting room was. It is experimental at the moment. I do not know how far our clients will start using it. In principle I think there is nothing wrong with that at all. In terms of government departments, I think we have got to be careful about that because quite a lot of our clients see government departments as the enemy in some way: they see the reason they are in trouble to be because of what some government departments are doing to them. Therefore, they come to the CAB for help in dealing with the big nasty bureaucracy that is doing nasty things to them. We need therefore to think carefully about having the Benefits Agency datapoint in the Citizens Advice Bureau, for example.

627. That is not really what I am describing. Even with your earlier function of a paper-based world people come in to you and you either say, "Yes, we've got a leaflet here, take a look at that and we will go through it," or they say, "Go down the road and that guy will tell you where to find that piece of paper." That will go on screen. You provide the screen and the access point at which people can come in and start interrogating the screen. You are there to do the signposting. You will say to them, "I'll help you bang your way through that" and that is where to find the equivalent of the leaflet because as more of that goes electronic that is the help they will need. It is information and signposting in exactly the same way you are doing it in the paper world done electronically.

(*Dr Craven*) That is right. These databases are the electronic form of a waiting room leaflet and indeed, you have government leaflets in stacks in a CAB waiting room for people to pick up and take away or whatever.

(*Mr Garlick*) The Contributions Agency were in touch with us a couple of months ago. They are conducting a pilot that I think amounts to wanting to replace leaflets with information on a touch screen terminal and they have asked us if we would find a bureau that would be willing to take part in this pilot along with other community access points. That kiosk system, to the best of my knowledge, is being installed in May in a bureau in the north-east of England. The problem we actually had was in locating a bureau with a big enough waiting room to put a kiosk in. It sounds silly, but it was a fact that the first two said, "Yes, providing you could hang it on the wall!" That is actually happening and we have looked at the information content and it is as much as you would expect to find in any of the leaflets. Our interest is to look at the access issues and to see whether people can use it, will use it and what help they need to use it. I think it is our role to put the two together.

628. You said you see the government developing electronic information services. What is your view of how they are being developed? Are there ways in which you would wish to see them developing them differently? Is what Social Security is doing in this field going down the right track or the wrong track?

(*Mr Garlick*) I have got one small point which occurred to me as a result of the exercise I was talking about. If there is a consistent and a coherent approach that is fine, this was two or three agencies working together putting information together on one system, there is a danger we could end up with half a dozen different computers each containing information from different government departments within the waiting room. This was the Contributions Agency working with a couple of others. What next? Do other people come along with another terminal and do you have to go to that computer if you want to get information from those departments and another kiosk in the waiting room for another set of information, and are these developments actually being linked together so that what the client sees is something consistent and coherent? Once they have learned how to use the kiosk, will they be able to access all types of information or is every government department going to develop its own interface to these information systems? I do not know.

Lord Gregson

629. If you are not careful you will be providing a service to the haves instead of the have nots.

(*Dr Craven*) A lot of the haves do use us still. It seems to me that in developing these information databases now it would be a waste if one simply

Lord Gregson *contd.*]

reproduced what the leaflet looked like on screen. We have the potential to make it much more interesting, much more exciting and much more grabbing with video, sound and colour. There is a lot you can do which is very difficult to do on a written leaflet. I would like to see people being much more experimental in thinking about how we present this information and maximise the chance of people hearing the messages and doing something about it.

Baroness Hogg

630. Are you the people who can afford to do this or is it more important for you to force back on government the duty of presenting its information in a form that can be interrogated by yourselves and your clients?

(*Dr Craven*) My own personal view is it is the latter.

Lord Hollick

631. Surely there is a case for you to require government to actually provide the information, which is after all the basic data that you need to do your work, in an electronic form, formatted in a way that can be used. Why should you bear the cost and use your scarce resources, your voluntary resources, to do what is after all the job of government? Is that an area that you are lobbying? Are you lobbying for that issue?

(*Dr Craven*) We have been doing that. I think that is a very fair point to make. The only caveat I would add to it is that government has got a lot of markets to meet. If you went and lobbied government to produce it in a form that was useful for us it might not be useful for somebody else and they might say, "We have to make a lot of compromises about the way in which we provide that information."

Baroness Hogg

632. Surely the users of Social Security information with common interests should get together with the Department of Social Security to see if information cannot be provided in a form that is accessible and useful to you all.

(*Dr Craven*) Certainly. I think that is a classic example of what I was talking about earlier, about how far can people with a problem about Social Security get the information they need from an information database and how far do they need to get into personal advice. I think that for me is one of the key issues in terms of the advice process and people's needs for information. Where do you pass from being able to do it yourself with a computer screen and having to deal with an adviser? I do not know where the line is.

633. Is there not the danger that you are taking yourselves down the wrong route when you should be combining with lots and lots of other organisations to ensure that the basic material on which you are then operating in terms of electronic information from government is delivered to all of you in a form where your value-added is not an expensive exercise?

(*Dr Craven*) Yes. I have doubts as to whether government can deliver it to all the different potential users in a form which all of them would say was fine. However basic statutes and case law from courts and tribunals should be provided by government.

634. But benefit levels and eligibility criteria, I would have thought there is a common interest in organisations like that.

(*Dr Craven*) Key things like that, exactly. Much of our work involves people who come in with a Social Security problem but you might find they are also in debt and you have got to work with them to draw up a financial statement of their income, to work out their priority debts, to secure their accommodation etc. I think only personal advisers can do that. The basic information base, which is the statutes, eligibilities and so on, is the area where there is a good deal of scope for co-operation.

Lord Hollick

635. You emphasised the fact that you are now looking to add value to basic information and you describe in your paper that you sent to us a rather interesting initiative in London for linking 45 bureaux to a specialist advice centre. That maybe cuts across the autonomous model that you described earlier on, but is not the way forward through centres of expertise where people, both helpers and possibly your clients, can link in electronically or maybe by the old fashioned telephone? Is that not surely the way forward, particularly given the turnover you have with helpers?

(*Dr Craven*) The London Link project is just for advice workers to link into sources of expertise. Members of the public do not do that. Workers use it when they have got a client and cannot sort it out and have to ring somebody up. Certainly we describe in the paper that one way forward is to develop centres of excellence such as that. I mention there a network on immigration, for example, where all the people who know about immigration matters link themselves together electronically via databases, bulletin boards, e-mails, etc. You have a whole community of immigration experts all linked together and feeding off one another. You can see that develop in other subject areas. We certainly see that as the way forward. The telephone access thing I think is as important too. 40 per cent of CABx advice work is done on the telephone. People ring the bureau to get advice on the telephone and it is growing. So people are very happy to use the telephone as a way and means of accessing information and advice. You can do a lot of the advice process over the telephone, more than you think. You would think that you could not take it very far because you cannot see the papers. You can do much much more than that. There does come a point when you need to speak to the person and talk to them and to see the written papers, and if you are doing something like representation work you cannot do it over the telephone. The model we have is a bit like a GP and specialist model, we have all

Lord Hollick *contd.*]

Citizens Advice Bureaux able to work to a certain standard. We hope that is a high and improving standard. Then there are other bureaux and other centres who can work to a higher standard. What we see the Superhighway enabling us to do is to have most bureaux accessing these centres of excellence so that they can deal with cases as far as they possibly can. They should not be limited in what they can do by limited access to expertise.

Lord Flowers

636. I wonder whether we could go briefly back to the interesting things you said about the Cambridge OnLine project. It follows on from what you have just been saying. You have got terminals at two Citizens Advice Bureaux, two libraries and at the housing department and the Local Council for Voluntary Services. If you like, some of those are second referral places from your point of view. I wondered which are proving the most popular, or is there any sort of division of work going on between them?

(*Mr Garlick*) The problem we have in answering that accurately at the moment is that the statistics available from that project (and I was sent the latest by the manager of Cambridge bureau just the other day) are all about the nature of the information being accessed rather than where it is being accessed. However, to quote fairly accurately from the manager of Cambridge CAB, the point of greatest access is very much the Central Library in Cambridge where she describes the situation as "queues forming" to actually "grab access" to the information systems. She thinks that is followed by, but very much at a lower level of access, the central Cambridge CAB with the other players being much less used in terms of access. That appears to be the position to date, the Central Library being overwhelmed with interest.

637. So there is an indication that people want to get their hands on the raw data rather than somebody's interpretation of it as you would provide?

(*Dr Craven*) Yes, I think so. This is experimental. One knows from the data that we have got there that the most popular type of information is what is on in Cambridge—what is happening in their local cinema, what is happening in their local theatre and one can see that you can go to a machine and get that. That seems to be the biggest category of information. Something that we would deal with, like benefits, has very much lower usage and so it may well be that when people think, "I have got a benefit problem," they think, "I will go to the CAB." It may well be that when people want to know what is on at the local cinemas they will think, "I will punch this in while I am at the local library." I think the different types of information on the database are having an influence on what people are getting out of it.

638. It might be interesting to have a break down of those figures if you can provide that.

(*Dr Craven*) Yes.

Chairman

639. When you talk about having a network system which links all of your CAB services to one another and to the central organisation, are you thinking there of an "intranet", which is in some way separate from the Internet, or is that just linking into the Internet?

(*Mr Garlick*) We took advice on this from the consultants we employed to help us develop a vision for the future. The intranet, I confess, is a word and a concept I was not familiar with six or nine months ago. The consultants came back to us and said, "We think the situation you have here will very much lend itself to the concept of an intranet with gateways from that to the outside world." You have got the aspect of confidentiality of information, the need to keep a lot of this communication closed but wanting to have gateways both into and out of our own systems. I think we are very interested in this concept. In terms of taking the strategy forward, what we will be asking the people that work with us in the next stage, is to help us develop this concept of an intranet, what does it mean, how would it be supplied. Are there solutions out there? The problem we have in the CABx in terms of IT is that we do not see ourselves at the leading edge of technology and yet the intranet is something that is only now starting to appear on suppliers' stands, and I am not sure how well developed these products are.

640. It is a quite common concept in industry, of course, where they are much concerned with confidentiality. Although the information that you provide, I would guess, is rather rarely confidential, the advice that you give to individual people about their problems might very well be confidential. So if you get into the situation of using a network for giving advice as well as transmitting information then security might become a problem.

(*Mr Garlick*) Yes, indeed.

(*Dr Craven*) It is where a record of advice is attached to a name and address that we get into confidentiality problems. We keep our case records in that form. If you stored information, for example, at a point distant from the bureau and you had both the advice given and the details of the client together on some sort of *pro forma* then I think there could be confidentiality problems. Advice to us was that we ought to get into encryption for some of that data and also seriously think about the circumstances in which we needed to attach names and addresses to the information that we stored. I think there is a security issue there. Something we will address over the coming years is exactly how we manage that.

641. You used the medical analogy already once this morning and it is not perhaps surprising that you get into a similar problem to that facing the medical profession in this area and also, as we heard earlier this morning, the banks. I am afraid we shall have to stop there. Dr Craven, Mr Garlick, thank you very much. We would be very grateful if you would send us some further written information if you feel there

Chairman *contd.*]

is anything we missed out that we ought to know about or anything that occurs to you. Thank you very much indeed.

(*Dr Craven*) Thank you very much indeed for listening.

Supplementary memorandum by the National Association of Citizens Advice Bureaux

I am pleased to return the amended evidence papers as requested. I have also attached two further papers, one gives more detail concerning the Cambridge City Project as the committee requested. The other gives information on a further CAB collaborative project concerning an electronic immigration network involving CABx in Manchester.

Barry Garlick
Information Technology Manager

9 May 1996

CAMBRIDGE ON-LINE CITY PROJECT

Cambridge CAB has become the first bureau to provide free public access to local, national and international information via the internet.

Anne Campbell, MP for Cambridge, a member of the House of Commons Select Committee on Science and Technology and Vice-Chair of the Parliamentary Office of Science and Technology, initiated the Cambridge On-line City Project in Spring 1995. The aim of the project is to help disadvantaged groups overcome barriers to their benefiting fully from the Information Technology revolution. Since January 1996 the Project has provided members of the public with free easy access to a comprehensive local information system as well as full access to the Internet.

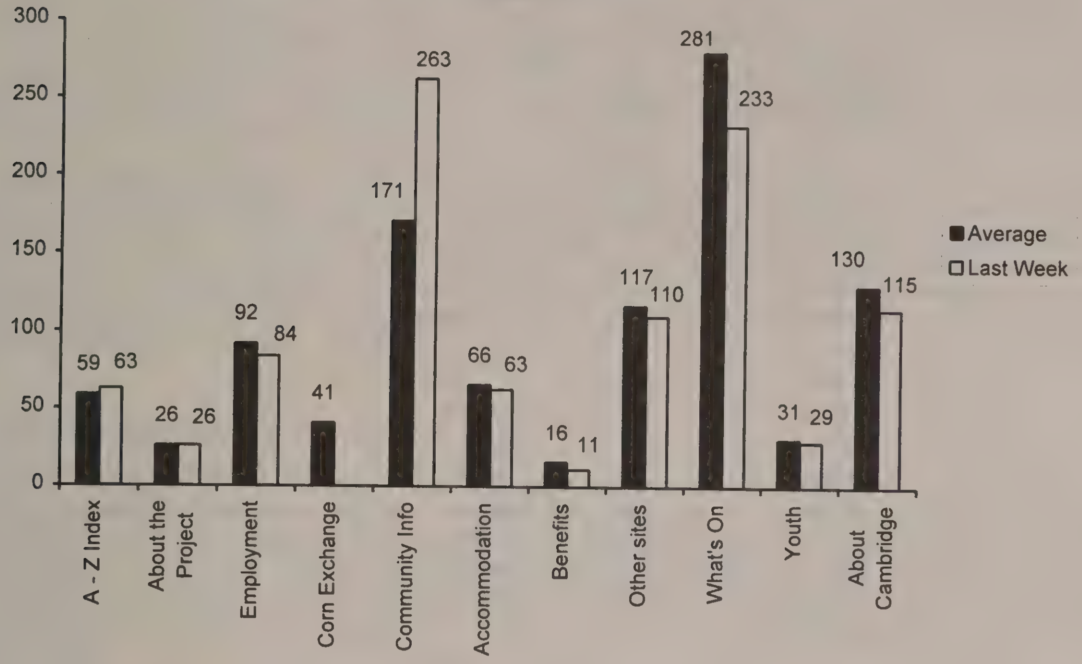
Six pilot sites were chosen including the main bureau and the bureau at Addenbrookes Hospital, as well as two libraries, a Community Centre and the Council for Voluntary Service. The six pilot sites are being sponsored by Cambridge Cable who have supplied the phone line and are paying for the calls, and Pipex who are supplying free access to the Internet via the World Wide Web Server. The County Council and Addenbrookes Hospital have generously provided the computers and appropriate modems.

The bureau equipment has already been installed near the waiting area where it is easily available and also under the eye of the receptionists who can support clients who need help accessing the information and ensure that nobody hogs the system. First time users and people with disabilities can find the mouse system difficult to manage. Technology and finances permitting it would be better to have touch screens in more secure kiosks with ideally local information available 24 hours a day on the outside of the building while the more detailed information on the internet is available inside.

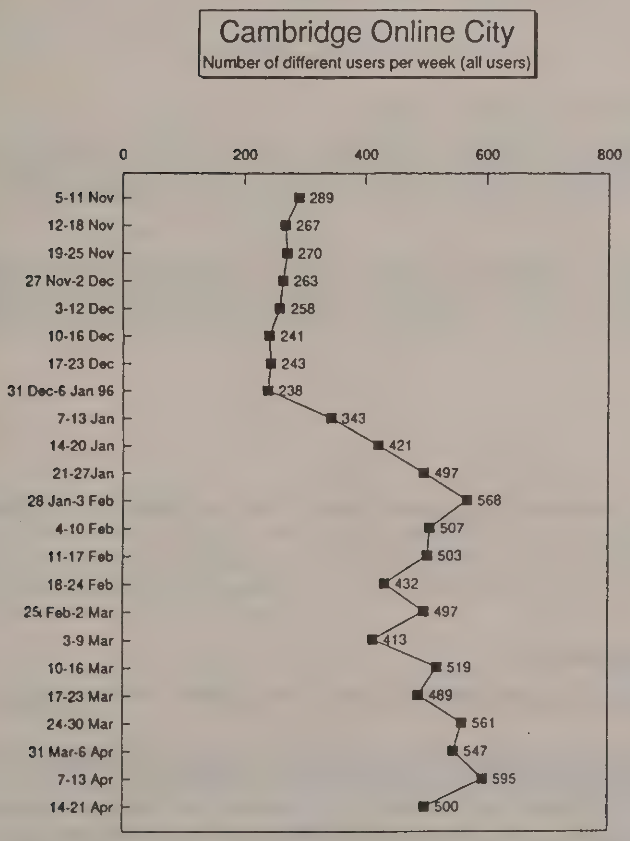
BENEFITS WE BELIEVE WILL COME TO THE COMMUNITIES WE SERVE FROM THE ONLINE CITY PROJECT

- The majority of users so far are familiar with computers, but have no current access to one due to unemployment or being on a low income. They are often searching for job vacancies and employment agencies throughout the country and can find the E-Mail and the opportunity to prepare and print out their own cv's very useful.
- For those who require a straightforward piece of information they have the satisfaction of finding the answer themselves or finding the appropriate contact, cg, local self help groups, whats on, vacancies at local hostels for the homeless, the advisability of travelling to a particular country. This saves time and relieves pressure on staff and volunteers whom they would otherwise have to wait to speak to.
- Most importantly for any one who needs further help, explanation or advice, CAB trained advisers are on hand to follow an individual person's problem through with them as appropriate. This can lead on to complex negotiations with creditors or employers or representation at tribunals, services which more straightforward information providers such as libraries are unable to provide.
- Access to E-Mail and Internet enables our specialist advisers to take advantage of the newly formed electronic networks on Immigration and Welfare Rights for example. Access to recent law reports, case precedents and relevant bulletin boards enables us to provide an improved advocacy service for our clients who are on low incomes. They cannot afford solicitors nor use the Legal Aid system, which in most cases does not cover tribunal representation.

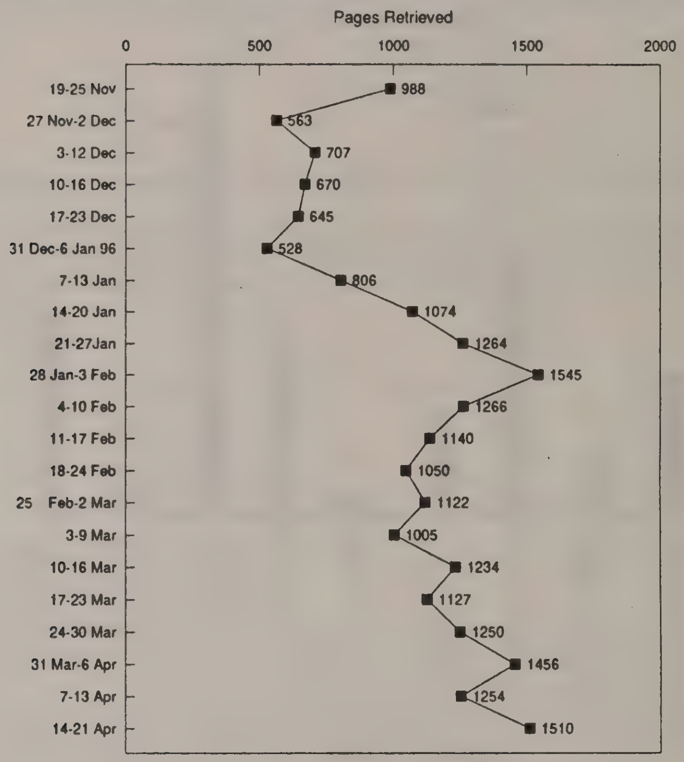
Cambridge Online City
Average use per page, per week (since end January 1996)—All Users



Cambridge Online City
Number of different users per week (all users)



Cambridge Online City
(pages retrieved per week)



ELECTRONIC IMMIGRATION NETWORK

March 1996 Issue 3

Launch of the EIN WWW Site on the Internet

The EIN project now has a home page on the Internet. It gives the user easy access to a large number of resources from around the world on the Internet for the price of a telephone call—a local telephone call in many instances!

Although the Electronic Immigration Network (EIN) has not yet been launched, you and your organisation can prepare yourselves for the launch now. Actually, there is already a service you can start using immediately. By using this service now you will have the skills to use the services of EIN when the project is officially launched.

What do you need?

In order to access the Electronic Immigration Network and the Internet you will need to have five things in place:

- Computer
- Modem
- Access to a telephone line
- Subscription to the Manchester Host, part of the global GeoNet e-mail system which the EIN project uses
- MailStation, a windows based communications programme which allows easy access to the Manchester Host

More details of the equipment required and the likely costs of each component are available in our *Information Sheet No. 1*. If you do not have this already, please contact Finn at the address at the end of the newsletter.

TRAINING AND SUPPORT

If you have never used a computer before you will obviously have to get some basic training. The Electronic Immigration Network is unable to provide such training. We assume that those who join the EIN project will already have basic computer skills, particularly in word processing. MailStation, the communications programme which is used by the project, is quite easy to use. The EIN project can only provide limited training and support at the moment on how to use the e-mail facilities, access databases and access the world wide web on the Internet. If our funding situation improves we hope to increase our capacity for training and support. More about this in future newsletters.

So why not get a subscription to the Manchester HOST (and buy a modem if you have not already got one) so you can start gaining experience in using the facilities mentioned above. This will enable you to be ready to use the Electronic Immigration Network when it is launched. Your subscription will also enable you to send and receive electronic mail (e-mail) immediately. There are potentially 35 to 40 million e-mail users in the world. You would also be able to create your own mailing lists of e-mail recipients. Received messages would be stored on the hard disc of your computer, thereby avoiding the need to retype that document if you wished to edit it for your use.

HOW TO USE THE EIN SITE ON THE INTERNET

If you already have the five things mentioned on page one then you can access the Internet. This site can also be accessed by subscribers of systems other than Manchester Host. This site, however, will be the only resource which will be accessible to non-subscribers of the Manchester Host after the launch of the Electronic Immigration Network. All other information resources like the project bulletin boards, bulletin boards operated by the participating organisations and the EIN database will only be accessible to subscribers of the Manchester Host. This has been done in order that the issues of confidentiality and security be properly addressed.

The World Wide Web home page of the Electronic Immigration Network is located at the following address:

http://www.poptel.org.uk/ein/

With this newsletter we enclose a printout of the EIN home page on the Internet. After connecting to this site, you can select any of the links to information resources around the world by using the mouse to double click on the appropriate link. This will connect you to the selected site without your having to type the individual addresses.

As you will see when you access the information resources listed on the EIN site, there is an enormous amount of information to access. If you are preparing an asylum application or an asylum appeal for a client, you will be able to obtain useful country of origin reports from Amnesty International, the US State Department, etc. You will also be able to download these reports (free of cost) to your computer and make a printout if so required. All this will be possible in many cases for the price of a local telephone call!

The list of resources on this EIN site is not a complete list of what is available on the Internet on immigration issues. If you have any suggestions of other useful information resources on the Internet that we should add to the EIN site, please contact Milan.

NEWS UPDATE IN BRIEF

Constitution

The Steering Group has now finalised a constitution and is in the process of having the Electronic Immigration Network registered as a Company Limited by Guarantee and as a Charity. Many thanks to Bev Cross from Sheffield Law Centre and to Ray Forbes and David Heyes from Manchester Citizens Advice Bureaux Service for all their help with this task.

Index for the EIN database

The Index Group has finalised a draft, which was sent out for wider consultation last month. They are now in a position to finalise the index of keywords which will enable work on the database to begin. The Steering Group thanks everyone who sent in their comments to the draft. They would also like to thank the members of the Index Group: Jane Coker (solicitor), Jim Gillespie (barrister), Hilary Plews (solicitor, CAB), Paulette Storey (Information Production Department, National Association of CABx) and Frances Webber (barrister).

Fund raising

Applications have been sent to various trusts and charities for grants for the EIN project. If you have any suggestions about where we can apply for funding or if you wish to make a donation to the EIN project please contact Finn.

The Steering Group

Rochdale Racial Equality Council has joined the Steering Group and is providing resources (staff time etc) for the development of the EIN project. The present membership of the Steering Group of the Electronic Immigration Network is:

- Federation of Independent Advice Centres (FIAC)
- Greater Manchester Immigration Aid Unit (GMIAU)
- Immigration Advisory Service (IAS)
- Immigration Law Practitioners' Association (ILPA)
- Law Centres Federation (LCF)
- Legal Action Group (LAG)
- Manchester Citizens Advice Bureaux
- National Association of Citizens Advice Bureaux (NACAB)
- Refugee Council (RC)
- Refugee Legal Centre (RLC)
- Rochdale Racial Equality Council (Rochdale REC)

WHERE DO I GET FURTHER INFORMATION ABOUT THE EIN PROJECT?

If you are not already on our mailing list for future newsletters, please contact either Finn or Milan.

If you require any technical advice from us, or information about the likely costs associated with the purchase of the necessary equipment or its technical specification, or details of the subscription charges for using the GeoNet electronic mail system through their Manchester Host (which the EIN project uses), please contact Milan.

EIN newsletters are also accessible on the Internet at the following address:

http://www.poptel.org.uk/ein/

Copies of the newsletter and information sheets can, of course, also be requested by contacting us.

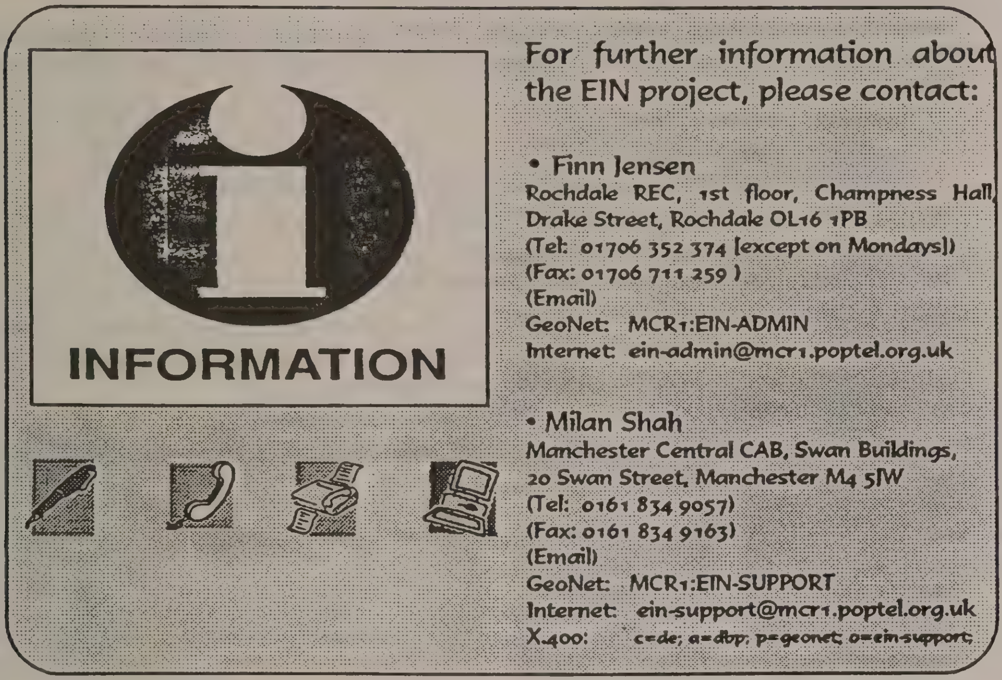
WHAT THEY SAY. . .

"The Refugee Legal Centre welcomes the substantial progress made by the EIN project and the increasing interest and participation of a wide range of organisations. The EIN may provide an invaluable, low cost, convenient and speedy means of acquiring and exchanging information relevant to those representing asylum-seekers and refugees in the UK, as well as those working in the field of immigration."

Barry Stoyle
Director
Refugee Legal Centre

"As the largest national charity with offices throughout the UK giving free advice and representation on immigration and asylum matters Immigration Advisory Service is pleased to be on the Steering Group of the Electronic Immigration Network. In such a volatile area of the law where individual lives are so greatly affected the EIN project will provide much-needed access to legal decisions and precedents which will be invaluable to appellants' representatives in improving their chances of success."

Keith Best
Chief Executive
Immigration Advisory Service


INFORMATION

For further information abou
the EIN project, please contact:

• Finn Jensen
Rochdale REC, 1st floor, Champness Hall
Drake Street, Rochdale OL16 1PB
(Tel: 01706 352 374 [except on Mondays])
(Fax: 01706 711 259)
(Email)
GeoNet: MCR1:EIN-ADMIN
Internet: ein-admin@mcr1.poptel.org.uk

• Milan Shah
Manchester Central CAB, Swan Buildings,
20 Swan Street, Manchester M4 5JW
(Tel: 0161 834 9057)
(Fax: 0161 834 9163)
(Email)
GeoNet: MCR1:EIN-SUPPORT
Internet: ein-support@mcr1.poptel.org.uk
X.400: c=de; a=dbp; p=geonet; o=ein-support;

ELECTRONIC IMMIGRATION NETWORK (EIN)

STEERING GROUP OF THE EIN PROJECT

- EIN Newsletter—May 1995 (Issue 1)
- EIN Newsletter—October 1995 (Issue 2)
- EIN Newsletter—March 1996 (Issue 3)

Coming soon! From the Refugee Legal Centre's (RLC) Research and Information Department: Responses to queries from their caseworkers. These "queries" files cover some 60 countries.

FURTHER SOURCES OF INFORMATION

- UK Passport Agency
- Home Office Immigration and Nationality Department
- Foreign and Commonwealth Office (FCO) On-Line
  - FCO Background Briefs—Index
  - FCO—Consular and Travel Advice
- US Consular Travel and Advisory Information
- Statewatch
- Refugees and homeless in UK—resources
- UNHCR RefWorld database
  - UNHCR CDR Refugee background papers
  - UNHCR CDR responses to information requests
  - WRITENET country papers
- US State Department country reports on human rights practices (1993, 1994 and 1995)
- Lawyers' Committee on Human Rights
- Amnesty International (AI) External Country Reports (1994, 1995 and 1996)
- Human Rights Watch (HRW)
- International Committee of the Red Cross (ICRC) Web Site
  - ICRC—Operations by country
- International Federation of Red Cross and Red Crescent Societies (IFRC)

- OneWorld Online Home Page
  Provides links to numerous organisations like CAFOD, Christian Aid, New Internationalist, ODA, OXFAM, Save the Children and UNICEF-UK. Use the search facility listed below for block searches.
  - Searching OneWorld Online
  - OneWorld Online Newsfeatures
    Includes a section on Refugees and Migration in their Global News
- Canadian Immigration and Refugee Board (IRB) Annual Reports
- International Refugee Documentation Network
  There is currently no information at this site
- Human Rights files accessible through Intac
- Human Rights in China—Gopher
- Under the Volcanoes—Special Focus on the Rwandan Refugee Crisis
  (International Federation of Red Cross and Red Crescent Societies)
- INCORE guide to Internet sources on the conflict in Sri Lanka
  (University of Ulster, Northern Ireland)
- On-Line Migration News
  Newsletter on Migration and Immigration issues
- Forced Migration Mailing List Gopher
  Discussion list on Forced Migration
- UFSIA Mailing Lists
  Includes discussion list on Asylum
- Queer Immigration Mailing List
  Discussion of the effect of immigration policy on gay/lesbian/bisexual/transgender (GLBT) people and their allies
  - Search the Queer Resources Directory (QRD)
  - The LGB Guide to Great Britain
  - QRD: Children of the QRD
    GLBT resources in other countries
- The World Factbook 1995
- City.Net—Country Information
- US State Department Country Background Notes
- US Immigration and Naturalization Service Country Papers
- News from Reuters Online
- The Electronic Telegraph
- DIANA—International Human Rights Database
- University of Minnesota Human Rights Library
  - Human Rights Instruments
- European Research Centre on Migration and Ethnic Relations (ERCOMER)
  (University of Utrecht, the Netherlands)
- Refugee Studies Programme, Oxford
  (University of Oxford, UK)
- Centre for Research on Ethnic Relations (CRER) database of resources
  (University of Warwick, UK)
- Ethnicity, Racism and the Media (ERaM) Programme: Related WWW Sites
  (Research Program, University of Bradford, UK)

WEB SEARCH ENGINES

- Lycos Search
- WebCrawler Search
- Yahoo Search
- Alta Vista Search
- InfoSeek Net Search
- Inktomi Web Search

11 March 1996

TUESDAY 7 MAY 1996

Present:

Butterworth, L	Haskel, L
Craig of Radley, L	Hollick, L
Flowers, L	Phillips of Ellesmere, L (Chairman)

Examination of witnesses

M R Verrue, Director General, and M. J E de Cockborne, Head of Unit, Telecommunications Legislation, Directorate General XIII, European Commission, examined.

Chairman

642. May I say how very grateful we are to you, Director General, for coming to give evidence this morning, and for being so helpful in submitting a paper describing the topics which you think we should be studying. Perhaps you would like to begin by introducing yourself and your colleague, M. de Cockborne, and then begin to run through the set of questions, recognising that my colleagues and I will probably feel impelled to interrupt you at some point to ask for further clarification.

(*M Verrue*) Thank you very much for the invitation. It is always an impressive and challenging opportunity to participate and give evidence to Committees of the House of Lords. Judging from the drafting of the questions it is clear that, as on other occasions, the preparation of this debate has been extremely professional. I think those questions[1], covering one page, are almost the entire grid of issues, which characterise the emerging phenomenon of the diffusion of information technologies and the emergence of an Information Society; so I think this is a very deeply and well thought-out, and also not very easy, series of questions. I have taken the initiative, with your permission, of being accompanied by Monsieur Jean Eric de Cockborne. Because I have only a four-month seniority in this position, there will certainly be a number of points on which he may need to correct me, so I would like your authorisation to do this.

643. Of course.

(*M Verrue*) Thank you. Would you like us to begin?

644. Yes, please.

(*M Verrue*) The phenomenon of an Information Society, which is a comfortable way of naming it but is not necessarily the most precise concept, is the result of two waves of technological changes. One has to do with electronic technology as such. That was foreseen many years ago. It has to do with the fact that the capacity of the various generations of processors to treat electronic information has increased in an exponential way while, at the same time, the capacity of networks—and that is what is new in the last five or ten years - to channel information, particularly as a result of digitization, has increased equally exponentially. The combination of the two phenomena produces something which is a relatively recent phenomenon, maybe ten years old, which in our view is going to have very far-reaching consequences. It is already having far-reaching consequences beyond the first two or three waves of diffusion of electronic technologies, in particular, in production activities. This is why we have in Brussels at various occasions, particularly at the occasion of the Bangemann Report 1994, and also at the occasion of the subsequent G7 meeting in February 1995, labelled this phenomenon as “Information Society”. This concept is also an indication that we believe this phenomenon should be looked at from a very broad perspective and not simply from a production-oriented perspective. It is more than a purely technological phenomenon. We believe it is a phenomenon which is already having very, very deep consequences of a social and societal nature eg. as regards the organisation of work, the organisation of economic life at large, the balance between the service and the non-service economy, the nature of education—in short, a very wide-ranging array of societal consequences. This is not necessarily equally accepted or understood in the same way in the United States of America, for instance, or in Japan, although the G7 discussions have made good progress in this. So to give a shorter response to question number one, there is a different approach to this phenomenon on the EU side and it is not simply a Brussels view. It is something which is widely shared by all our Member States, and also by those Western European countries which, for all sorts of reasons (which is another debate), have not joined the Union yet, but they agree with the fact that this is something more than of a purely technological nature. The second question concerns the problem of copyright—and particularly intellectual copyright. In a situation where the spread of the diffusion of digital technologies does indeed represent a new area for the circulation and the dissemination of information of all kinds, inevitably, the question is raised as to whether in this new environment the existing legislation concerning copyright protection is adequate. Maybe what I should first say on this is that this problem is still being discussed, studied and examined. We have not yet come to conclusions to those studies—probably because we have not yet fully analysed and discussed the issues—but they are recognised as clearly existing issues. To be precise on what the exact situation is, WIPO is clearly going to have to play a very active role on those issues, because they can only be dealt with at a very broad international level, and we certainly intend to propose that European Union Member States try to

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[1] The questions were based on the call for evidence.

Chairman *contd.*]

produce, as a sort of intermediate step, a consensus view among themselves on the various copyright and copyright-related issues. That would help the debate within WIPO, which already has planned a conference for the end of this year in the framework of the so-called Digital Agenda of WIPO, which was discussed eighteen months ago. We will try, just to finish on procedures, to help produce an EU position with a Communication which we, on the Commission side, are going to address to our Member States and to the Council and Parliament by the middle of this year. You certainly remember that the Commission already produced a Green Paper on intellectual copyright and copyright-related issues in July 1995, so we are not starting from scratch on this. The difficulty for the legislator and the regulator subsequently, as regards copyright and copyright protection problems in the new networks—where again capacity and speed of circulation of information is now becoming very, very high—is, of course, to strike a proper balance: on the one hand, between over-regulation of the networks, which would not necessarily mean that the problem would be properly kept under control but it would certainly mean that distortion in the flow of information would take place between the over-regulated and less regulated places; and, on the other hand, to find also a balance in the sense of protecting copyright as well as—but this is a point which we may discuss at a later stage in this contribution—of ensuring when this is necessary, the confidentiality, the integrity and, perhaps, in some cases, the secrecy of information circulated, subject of course to the usual security and related preoccupations. So to summarize on this point: in this new information and knowledge-based phenomenon which is now spreading rapidly—sometimes even more rapidly than what is planned or expected—there are serious copyright issues which will not be easily handled and which can probably only be properly handled at international level. Again the EU is working on this and it is a necessary intermediate step because networks do not stop at EU borders.

645. Could I just interrupt you at that point because some of my colleagues might wish to press you a little on what we do indeed consider very important: could I begin by asking, given the responses that you will have had to the Green Paper and your feeling for the different national attitudes within the EU, do you foresee much difficulty in arriving at a consensus European view, as an input to the international Net?

(*M Verrue*) I would respond by way of maybe a revealing anecdote. It is not a way of dodging the question. As I said, the difficulty in trying to find a solution to the various copyright issues raised by the development of networks, particularly Internet but also similar networks, is to find a proper balance between what can be regulated and what should be regulated. To some extent, but for completely different reasons, a similar debate has begun to emerge where there are a number of problems having to do with morality, pornography, extremist political views, which have been circulated on the Web recently. At the Bologna Informal Council of Culture and Telecom Ministers—it was a joint meeting, at least part of it—this question of so-called Internet regulation, which is a point which you raised in your series of questions as well, was discussed. I was surprised and also encouraged to see that there was not much of a clash between those considering that a tight regulation of the Web was necessary immediately, and those who may have taken a very, very liberal (in the usual sense of the word) and not a political view. First of all, the principles of legislation should apply, irrespective of whether it concerns information on the Web or not, and the development of such legislation should continue irrespective of the phenomenon which can be perceived on the Web or not. Morality or copyright protection should not be limited, in essence, by the development of the Web; but, at the same time, people recognise that the effective possibilities, or technical possibilities, of controlling the Web are limited. This discussion has indicated as well that the thirty Ministers—because there were Ministers for each specialty, from each of our Member States—certainly agreed on the need to explore rapidly, at EU level, the areas of consensus and to provoke a similar reflection at a broader international level quickly. I would not be surprised, for instance, that some initiatives could be taken at the occasion of the G7 summit in New York and I guess we, on our side, are going to make contributions of at least a problem-oriented nature during the course of this year; with a view to feeding debates, on the one hand, within WIPO which, as I have indicated, is also working on the question of Internet regulation or, on the other hand, maybe within OECD. So it is not a question of contention at the moment. The difficulties are recognised by almost everybody. The need to find a workable solution, which necessarily has to operate at international level, is also recognised. So there is no division line yet but we just have to be careful. There is also no division line among our Member States on those affairs.

646. Thank you.

(*M Verrue*) Question number 3 is probably one of the most far-reaching and one of the most difficult questions on your list. What I said at the beginning, concerning the combination of technological progress in the performance of processing capacity of semi-conductors, as well as the performance of networks, thanks to the progress in digital technologies is, to some extent, backward-looking. This is something which has already taken place. Further progress is continuing to take place but we begin to know, and to understand all the consequences of those two trends interacting. Convergence is something which is more forward-looking and which is going to have very far-reaching consequences. The issue is very simple. The progress of digital technologies, the capacity to compress information and the progress of optical fibre-based networks, all pave the way forward to something which is already available at the various laboratories of equipment manufacturers, a situation in which various types of information—text, voice, image, sound, outside voice—can be compressed and circulated at very high speed, very high volume, on the same network. This, of course, is going to mean that a number of activities and services, which are

Chairman *contd.*]

today still circulated on different support media, to different networks and for different utilisations, will be offered or will be available through the same technologies, on the same terminals, as far as end-users are concerned, and on the same networks. It turns out that, for various reasons—historical, political and others—the various activities and services which were offered and developed separately up until now, for instance, telecom service provision and, just to name three examples, broadcasting, various other audiovisual services, outside broadcasting, were subject to separate regulations. I think it is not excessive to say that in five years from now, at the latest, we will be in a situation where the same activity would be subject to different legal obligations or regulations unless we adapt the legal framework. Just to quote one example, licensing for the same activity may become organised in different ways which would be extremely complicated from a legal point of view. We have not yet pushed this debate very far at the moment in Brussels. This is not to say that we do not recognize that the problem does exist and will expand. It is essentially for two reasons. First, our immediate aim now within the EU, is to achieve by 1 January 1998 the complete liberalisation, including the legislative and regulatory reform, of the telecommunications sector in EU 15. By achieve I mean complete; that is, not only have the pieces of legislation, the Directives, adopted; but also to make sure that they are transposed in our Member States and implemented. Today this is supported by all EU Member States - the direction is not disputed, it is not challenged—but, of course, the debate concentrates on the five or six very fundamental Directives which are not easy and the 15 of our Member States do not necessarily agree on, each and every article of each and every Directive. In other words, we are in a time-consuming exercise. We want to do this first, but we know at the same time—and I would like to word this as carefully as possible—that, to some extent, immediately after 1998 or even after 1997, we will need to begin to review thoroughly and, on the basis of empirical and analytical evidence, the longer-term implication, also for regulatory reform, of convergence. We know that some of the work on legislation, which is taking place today in Brussels and in our Member States for transposition, will need to be updated and, in a number of cases substantially updated. Again, we will not want to avoid this problem. We fully measure this and I think I said that it is a trend which will have profound implications. We will produce a Communication on this by the end of this year, in order to prepare a discussion among our Member States and also our national regulators, who have extremely valuable and professional experience, during the course of 1997; so that we can begin to think what kind of practical conclusions for proposals, for changes in legislation, would have to be drawn during the course of 1998. Clearly, what can already be established is that the difference between regulation on broadcasting and regulation on other services than broadcasting will have to be ironed out and this is, as you can imagine—in particular in the Union—going to raise very thorny issues. If you simply think of the difficulty which we have today in simply reviewing the EU *TV Without Frontiers* Directive, which is a simple and limited revision exercise, then the next step will necessarily raise extremely complicated debates.

Lord Craig of Radley

647. I think we would generally acknowledge in the Sub-Committee the problems of regulation as between telecommunications and broadcasting and their convergence, and you have very helpfully described some of the issues on that. I wondered whether there was any sort of pattern world-wide—anywhere in the world I mean—which you feel would be helpful for the European Union and ultimately for the Member States. In other words, are we at the leading edge here, or has somebody got ahead? This is because I shudder at the thought of having to wait a number of years before this particular issue is tackled. Technology is moving so fast that we already, many of us, see the problem, and it is not going to get any easier as technology advances.

(*M Verrue*) I do not have the feeling that we are late in recognising at least the directions of the changes which technological convergence is going to have. If you look at the recent legislation which has been signed by the United States' President in February, it has a lot to do with the liberalisation and deregulation of the telecommunications sector and does not go very far or very deep into those issues which will be raised or are to be raised in the very short-term future, as you rightly indicated, by technological convergence. Japan has not begun at all to investigate what kind of legal consequences should be drawn from technological convergence and Canada recognises the problem, but has not undertaken any legislative work yet. Within the Union there are differences clearly and it is clear that in this country here both the DTI and the Office of Telecommunications, for instance, have already undertaken significant reflections on those problems. The French have also, though maybe to a lesser extent because at the moment they are heavily involved in the deregulation or regulatory reform of the telecommunications sector. The Germans and the Scandinavians have undertaken reflections. Nobody yet has taken the legislative initiative and we would like to make sure that we can at least open the debate at EU level before we are confronted with *de facto* splits in national approaches. We do not believe that the problems will differ in their essence between Member States, but national approaches could differ a lot and if you bear in mind the long, painful and to some extent unsettled debate which we had during the late 1980s and the beginning of the 1990s on TV broadcasting within the Union, we would like to avoid being confronted with a similar situation again, so we would like not to lose too much time. However and again to be perhaps more explicit, if we raise this problem too quickly, that is, before we have finished our work on telecommunications regulatory reform, we run the risk of being delayed in our work on regulatory reform in the telecommunications sector because of some of the consequences of convergence. Frankly speaking, I think it is wise to complete liberalisation in telecommunications first and then move on to looking at the legal and

Lord Craig of Radley *contd.*]

regulatory issues of convergence. It may sound a bit tactical, but there is a proverb in French which says, "*Un tiens vaut mieux que deux tu l'auras*" and I would prefer to be assured first of telecommunications liberalisation and then look seriously and quickly at convergence implications.

Lord Flowers

648. I do not want to be misunderstood by our witness as I am a pro-European, but we are dealing here with a subject which is essentially global. It does not matter too much what we do in any one country because it is the global movement that will count in the end, especially where content is concerned. Technical arrangements you can choose up to a point, but content is something which you can get from anywhere in the world where it is supplied, so in these circumstances what is the particular role for the European Union? Has it got a role in a truly global problem and, if it does have a role, is that role merely to improve the collaborative and competitive position of Europe versus the rest of the world?

(*M Verrue*) The problem of content is essentially covering three different questions: the first is whether or not content should be subject to control and regulation, and I mean content of what is circulated on networks in a convergence perspective; secondly, whether the content industry in Western Europe or in the Union is developing strongly enough; and, thirdly, whether contents can circulate freely within the Union as an Internal Market. This is separate from the conditions under which networks operate. Now, your question relates to what can be or should be the role of the EU and whether in the end the EU should have a role. I think one of the key responsibilities of the European Union and, in particular, the Commission, is to make sure that within the Union at large, the conditions of competition are sufficiently similar and equal. You may say that this has to do more with the conditions under which networks operate than what is circulated on networks. That is true with one reservation, namely that we could not imagine national attempts to regulate content circulated on networks that would not at the same time have an impact on competition. Maybe it is a sort of defensive or restrictive approach, but I think among the core businesses of the institutions in Brussels, and again particularly from the point of view of the Commission, if competition does not operate or function properly on networks within the Union, I think the responsibility of the Commission will be engaged. That is the first point. Secondly, as regards content, as I said before, either in relation to copyrights or in relation to other issues, like morality, extremist political views, if a solution is to be found, and a solution will have to be found because clearly some of these issues do exist, as has been illustrated in the last twelve months, at least within the Union the solutions need to be similar. This is the second responsibility of the Commission, to make sure that the Union, as an Internal Market also for telecom services or broadcasting services, remains an Internal Market. This may have to do more with procedures than substance. In other words, it may have to do more with the need to make sure that our Member States do not disagree too much and possibly agree on how content should be regulated, but it is again a responsibility which clearly lies in the responsibilities of the Commission. There is a third problem which has to do with the content industry which you raised at least indirectly. Of course today to a large extent the audiovisual industry, for instance, is an American industry and there are many people who fear that this dominance is going to be exponentially increased by the emergence of the new networks and certainly by the prospect of technological convergence. We do not necessarily share this view. There is a lot of evidence that an emerging content industry expansion is taking place in Western Europe at the moment. Of course this is a competition which we enter with our own strengths and weaknesses. We have a unique cultural heritage, we have extremely strong publishing enterprises and we have a sophisticated and demanding range of educational systems. We also have a number of weaknesses. We do not have large audiovisual firms, at least not similar to the ones which exist in Hollywood and of course we have the other side, the reverse side of the coin, our linguistic diversity. We have undertaken with EU funds to try and encourage a development of applications, new applications with new technologies for the content industry in Western Europe. We have several initiatives with our TELEMATICS programme or with INFO 2000. What we see is that the response capacity of the EU service industry, in particular on the part of medium-sized enterprises, say up to 200 people, in almost all of our Member States is extremely strong. They have problems in particular in access to finance, but it is not at all a sector of lame ducks and it is not at all an area in which EU service industries are bound to disappear even to some extent before existing. This is not true, but there is a difference in size. It is of course always difficult to plea for sectoral supports, yet these industries would merit such support, at least for quite some time. I would myself be in favour of direct support and not support by the regulation of markets, quotas, for instance, because I do not think that would produce results, but direct supports in our experience can bring good results.

Lord Haskel

649. Do you mean by financial means?

(*M Verrue*) Yes, seed capital or subordinate loans. There are a lot of techniques which can be used and again it would not necessarily require gigantic amounts of money and it would not necessarily need to be centralised in Brussels, but the potential return in terms of progressive consolidation of a strong content industry could be very high. If I could just for one second add one more element of response to the question raised by Lord Flowers, when I say that the Commission at first and EU institutions, as legislative institutions, have responsibilities as regards content for the way content is being circulated on networks, there are some very clear cases where if there is no decision made at EU level, we are sure to run into acute problems of distortions

Lord Haskel *contd.*]

of competition within the Union. For instance, everything which concerns the allocation of spectrum has to take place on the basis of similar, if not identical, rules among our Member States and will increasingly need to take place on the basis of such similar rules, otherwise the EU, as an economic space for these new activities, will be fraught with very, very severe distortions in competition. My impression is that as convergence is going to increase and spread, almost all questions concerning the management of scarce resources, like, for instance, frequency management, will need to be looked at in common, and I am not saying they will need to be decided on a certain basis case by case in Brussels, but they will need to be looked at very carefully in common among the 15 of our Member States, otherwise the natural tendency will be for such decisions to be taken on a not necessarily compatible basis with again potential huge differences. Thus as soon as selective approaches prevail, you never know how selectivity is applied and it could be very distortive. Since the new networks will be places of increasing intense media activity, there will come a day as well where the question of media concentration will have to be looked at in Brussels as well because equally if you have very, very contradictory approaches to media concentration or legislative approaches to media concentration on networks, you may have extremely distortive situations within the Union. Apart from the fact that in this case like in many others a minimum degree of homogeneity within the Internal Market is necessary, because of the nature of the new networks which are developing and because of the prospect of convergence, I do not think you could, legally speaking, envisage a situation in which you would have competing legislations on such issues. Our fundamental responsibility is to make sure that competition operates; it is not necessarily to intervene in the functioning of markets, provided competition operates.

Lord Hollick

650. M Verrue, you have mentioned three areas where governments play a role in promoting the development of the information society and I think you mentioned telecommunications and making sure that the rules are synchronised throughout the European Union. You have mentioned the possibility of investment in content and you have also mentioned that we should have rules to prevent undue media concentration. I think one thing that struck us in this Committee is the extent to which the United States has forged ahead in the development of the information society. I think of the three things you have mentioned, it is really the liberalisation and deregulation of telecoms which is a policy which they have pursued throughout the 1980s, but they have done nothing in these other areas. Are there any lessons that we can learn from the American experience of why they have apparently done so well and what should we import from that experience into the EU?

(*M Verrue*) First of all, on quite a number of legislative issues the Americans have already for quite some time accepted that the balance between the responsibilities of the Federal Government and the responsibilities of the State Government has to be reorganised. For reasons of predictability and transparency, homogeneity of legislation, they have accepted a fairly strong responsibility at the federal level. This of course has created for quite some time a situation in which, if you think of the activity of the FGG, the legal and regulatory environment is less diversified and perhaps more predictable for economic operators. This tends to be an advantage because it reduces the risk of having very diversified legal systems, sometimes contradictory. I think this has been an advantage for quite a number of years. As regards the development of new activities, in particular the content industry, apart from the fact that of course in the United States, as I said, there are some huge, world-size giants operating in the content industry, there is also a striving and dynamic sector of new firms in content and new programme development. It is clear that they operate in an environment in which it is easier, like in many other sectors, for new firms to be created and certainly easier for new firms to find capital. The structure of the small business capital market, in particular venture capital in America, which has been underlined repeatedly, is a very serious advantage. Is this something that should be receiving a solution at EU level or that should be receiving a solution at national levels? I do not believe we should necessarily look at this exclusively from an EU perspective but if your question is "Are there particular lessons worth looking at?", then this is certainly one of them.

Lord Craig of Radley

651. Following on from that, you say that the business of supporting content should be looked at nationally rather than being looked at from the EU point of view, and your comment that seed capital is a good approach perhaps rather than regulation is one which interests me particularly because I wonder what your comments would be about the occasions when attempts to help particular industries or companies nationally have fallen foul of some European Union legislation. I am not quite clear whether in this field of content one would not also run up against similar problems. Perhaps you would like to comment.

(*M Verrue*) Whilst I am not at all in favour of additional assistance to industry because I think that in all our countries, Maastricht or no Maastricht, there is a genuine problem of a very high level of taxation and assistance to industry tends to call for taxes because you must find the resources, in the particular case which I was mentioning maybe some more targeted utilisation of research funds for the development of new applications of information technology could be used for bringing the kind of initial support to the content industry which would be helpful without necessarily clashing with EU discipline on state aids. Of course the more you move away from research or application-related assistance to more traditional types of assistance, then the risk which you have mentioned is going to emerge. Secondly, I do not necessarily believe that start-up

Lord Craig of Radley *contd.*]

assistance should take the form of cash incentives. You could easily organise financial circuits. After all, the venture capital system in the United States is not using federal or sub-federal money: it is a mechanism which operates largely on its own merits. Anything we could do to consolidate emerging experiences would not necessarily imply vast amounts of subsidies to particular industries but at the same time would help a lot. So there are ways of circumventing this difficulty, which is a genuine one.

652. Thank you.

(*M Verrue*) There is also the problem of mentality. When I was in Bologna I was with my Commissioner, Mr Bangemann, and he met a small firm established in Bologna with its capital owned partly by an Italian firm which is very active in information technology. This subsidiary based in Bologna, which is using the novel writer Umberto Eco as one of its advisers, has undertaken to produce a series of CD ROMs on European history, starting with the 14th and 15th centuries. I have seen the one they have produced on the fourteenth and fifteenth century on European history at large. The result is very impressive and it sells very well and they even have problems of production capacity. They employ 120 people, almost all with a university degree with a combination of skills, as you can imagine, in such activities. What surprised me was when I enquired as to how they intended to try to market this product outside Italy for a product which is a European product (it does not concern the history of Italy only, as I said): I understood that essentially because of the cash requirements necessary to produce the same collection of CD ROMs with a number of changes in other EU languages, they were instead undertaking an agreement with an American partner to transform their product into an American edition of this collection. Clearly something is wrong. Imagine this collection being translated into American and sold in the United Kingdom. Obviously there are mechanisms which do not exist. Clearly the fact that they looked for an American partner has to do with financial considerations but again we are not talking of billions of dollars, so it means that there are some elementary financial mechanisms which do not exist and do not work properly that would normally lead these people to look for a partner in Germany, in the United Kingdom, in Holland, in France or in Spain. So the problem is not always a problem of not having proper incentives or subsidies. Mental reactions sometimes over-amplify the importance of an American partner in particular in those activities because those technologies are seen as coming from the other side of the Atlantic.

Chairman

653. Perhaps we should move on to the next block of questions which are all concerned with new services.

(*M Verrue*) I think I have, at least to some extent, indicated the conditions under which and the limits under which the new services could or should be regulated. Again our primary responsibility is to make sure that a competitive framework is sufficiently similar throughout the Union. To a large extent the regulatory reform in the telecommunications sector, which is under way in Brussels, and which, as I said, has to be brought to an end by 1st January 1998, will have a lot of consequences for the emergence of new services and in particular for the activities of new service providers. This has essentially the objective of establishing a modern competitive legal and regulatory framework. As you know, this policy is undertaken by a combination of EU Treaty legislation and national governments transposition and implementation. What we are doing is establishing the broad guidelines for the liberalization of the telecom sector which again will have far-reaching consequences on the activities of new service providers. Those guidelines are either decided by the Commission itself under Article 90 in a very few cases or proposed by the Commission in the form of Directives based on Article 100A in the large majority of cases. Among the key Directives which are at the moment being discussed I would mention the Directive on Licensing, the Directive on Interconnection, the Directive on the revision of the ONP (Open Network Provision) framework, the Directive on Telecommunication Terminals and Equipment. I have forgotten some of them but those are some of the key ones and some of the most difficult to discuss and negotiate in Brussels. Once each Directive is adopted, it is not the end of the story. Each Member State has to transpose the Directive into its own legislation and then implement it. This, to some extent, is a form of regulation or at least regulatory activity related to the emergence of new services but again our responsibility is primarily, if not exclusively, related to the construction of a joint competitive legal and regulatory framework. The rest is subject to what we said earlier concerning copyright protection, morality and related issues, and is left to the markets and to Member States, subject of course to the need to avoid barriers to competition. There is one point which raises a separate problem and which has been in the press in recent days in this country and that concerns universal service. Maybe I should make a comment on this now. Why do we discuss the question of universal service in Brussels at all? The answer is very simple. I could choose the easy way and say because some Member States require this, but there are more fundamental reasons! In any economic activity which is heavily characterised by the network phenomenon it is not sure that free competition will necessarily lead to an optimum. I do not want to come back to the question of natural monopolies but they tend to emerge in cases of unregulated competition where networks are heavily characteristic of the activity. There is, therefore, a doubt as to the extent to which the liberalisation of the telecommunications sector, to take this example, would necessarily in itself produce an equal access at least for a minimum level of telecom services to everybody in our society. This is why it is agreed, and in Bologna this question was discussed and there has been a very very wide consensus on this on the basis of a Communication by the Commission of two months ago which you may be aware of, that we felt that there was a need, together with liberalising the telecommunications sector, for our 15 Member

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States to agree on a basic range of telecom services which should be, as a rule, made available to each citizen throughout the Union in any place at affordable prices. At the same time because such universal service prescriptions are not free, we have to bear in mind the fact that the way that such universal service provision should be financed should not be producing barriers to entry for newcomers. This is, of course, an important choice and a difficult trade-off and it is important because of the following reason: all our Member States, with the exception of the United Kingdom, Sweden and Finland, are today in situations where there is one, very often exclusive, operator. In the United Kingdom and Sweden and Finland the markets have been liberalised quite some time ago, although I note that in the case of the United Kingdom one of the operators still has a comfortable market position but it does not have exclusive rights. In all our other Member States there is one operator with exclusive rights. If liberalisation is to be beneficial to the population it must imply a wider range of services at lower prices on average. Our conviction is that we will not achieve this simply by deciding that exclusive rights are suppressed. We must introduce at least for some time a bias in our EU legislation that is favourable to newcomers. It is necessary in order to achieve our objective of broadening services, improving services and again lowering prices on average, that newcomers can be brought into the sector, otherwise the whole exercise would not operate. This is why when we discuss universal service we have on the one hand to agree on a definition which is, I would say, an acceptable definition of universal service and I will come back on this in a second; and, secondly, on a way of funding a universal service that does not entail excessive barriers to entry for newcomers. This approach has been accepted. Our recommendation is that universal service should take the form of access to a standard telephone connection which in the state of current technology, of course, means that it can be used for voice telephoning or fax, it can be used with a modem for access to networks and, as you perhaps know, as illustrated by recent R&D achievements by BT, it can be used with relatively inexpensive equipmentfor high speed high volume data transmission as well. So it is not a cheap definition of universal service. It does not create two categories of citizens, those with standard telephone plugs and those with more sophisticated access to networks but at the same time we believe that this definition would be sufficiently moderate in its financial consequences so that the risk of creating new barriers to entry at the time when we want to bring new players into the sector would be kept to a minimum. Now there is a debate, and we have had this debate in the Commission when we discussed our Communication, which has taken place in the United States (and I have read some press cuttings of the newspapers in the United Kingdom) concerning the extent to which obligations should be introduced into universal service and prescriptions concerning the supply of services to schools, taking the example of the United States. They also had in mind the supply of advance services to hospitals and health care providers as well as libraries. We see, of course, a lot of merit in bringing classrooms in contact with the new networks which are emerging because such networks are going to channel soon, and have already channelled today, some extremely impressive educational tools. Secondly, regarding the health care sector, it is clear that at the time when to various degrees (but in almost all our Member States) the health sector is undergoing very very fundamental difficult and painful changes, using advanced communication technologies, broadband, in the health sector could produce huge productivity gains, quality improvement, quality improvement in diagnoses and perhaps huge financial savings. Incidentally, this can only be achieved with broadband connections otherwise you cannot really achieve the kind of medical technological process that would have far-reaching consequences like distance diagnosis and things like this and the same for libraries. Nothing in what Brussels has discussed on universal service prevents any of our Member States from introducing such additional elements into its own definition of universal service. The only problem is that the funding of the additional cost should not be creating barriers to entry into the sector. So it is not correct to say that Brussels has been cutting cheap Net links for schools. This is not true. Each of our Member States is perfectly free to extend the definition of "universal service". The only problem is that the financing of the additional cost which this extension of the definition would entail should be organised in such a way that it is not borne by potential newcomers into the sector, either domestic or other EU Member States. That is an important qualification because in Brussels we are convinced of the three objectives which we have discussed. We believe that they should be promoted differently but we know it is perfectly legitimate for a Member State to do it with its own definition of universal service, subject to the condition which I have just explained. Question number 6 concerns the two sensitive questions of confidentiality and security. Now in general, but in particular also for the development of one of the most promising and probably the most dynamic application of new services which is electronic commerce, there are two difficult questions, the one of confidentiality and the one of the security of information circulating on the networks which are at the moment open. Those are important questions, because if we take the example of electronic commerce (but we could extend the example) if an individual cannot be sure that the information he is going to channel on a network will reach its point of destination in the form in which it has been sent and can be certified, guaranteed to the point of destination so that the addressee can be made fully sure that what he receives is indeed coming from the sender and is reaching him in normal integrity and form, then there is a problem. If, at the same time, for a number of transactions, the same individual cannot be sure that what is circulating is kept confidential, then a large range of activities will simply not take place. This is why again in the case of electronic commerce (but one can extend the example), it is necessary to find a solution to in effect three problems. One is the problem of the integrity of information circulated. The second is the problem of certification, checking whether what is arriving is authentic. Thirdly, there is the problem of confidentiality. The first two problems have been

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investigated by us, together with experts and colleagues from our Member States, and we are going to come up in the coming weeks with a proposal at least as a basis for reflection. The proposal will concern the organisation of digital signatures on a harmonised basis within the EU and the setting up of a system of so-called Trusted Third Party Services which is a system whereby a third party in a communication between two people, firms or institutions, can intervene to guarantee the integrity of the text which is being communicated and, in particular, the signature. We have discussed this at length. We believe that there is a potentially strong consensus for this approach and we will put it on the table soon and discuss it more formally with our Member States. The problem of information security is more complicated. In particular it is more complicated because it concerns security which in the Union is organised or dealt with under the Third Pillar, in which our Member States continue to have exclusive responsibility and the right to initiate. We have here a situation which is a little bit paradoxical. On the one hand, it is clear that it is imperative to find a solution to the problem of security of information circulating on the network which would be, I would say, not opposed to the disciplines of public order, police and defence-related preoccupations. So any attempt to introduce encryption or ciphering into information circulated on the networks must, of course, be absolutely dependent upon adequate provisions concerning public order and defence-related considerations and so on and this is in the hands of each of our Member States. Secondly, one has to recognise that encryption technologies today, even if they are considered as secret material and equipment, are widely available on the market-place. Again, there is no way whereby a number of very very promising activities on networks can extend if the problem of security of information being circulated is not solved. Our intention is to encourage our Member States in a so-called Third Pillar context to envisage the possible solutions for this problem of encryption and ciphering. We see no possibility of avoiding finding such a solution and we see no other place but a Third Pillar context for such a problem to be investigated. Again, on this I do not want to be misunderstood; we cannot take a legal initiative. We have tried to convince the Member States (and I think we have managed to convince them) that the problem needed to be solved and that it was largely their responsibility to do it. We will raise the question again at the occasion of the proposals which we are going to make soon concerning a European network of Trusted Third Party service and digital signature but, of course, we want to separate the two carefully because one of them has nothing to do with the EU Third Pillar.

654. Thank you very much. As usual, time is overtaking us. Would you agree that you have touched on most of the other questions which we notified you of in advance and we shall, of course, be glad for other written evidence if you would like to provide it in that form but perhaps question 12 is one that you might be prepared to address briefly orally since it is a very important issue.

(*M Verrue*) First of all, on some of the other questions what I may do is organise with the Clerk of the Committee to make some written material available and you can exploit it as you wish.

655. We should be most grateful. Thank you.

(*M Verrue*) Question 12 is certainly one of the most sensitive aspects of the phenomenon of the fusion of information technologies and the emergence of the information society. There is a subdued but very sensitive phenomenon of fear that this is going to mean a massive wave of job destruction. Now the diffusion of new information technologies is going to be, or is already today, a far-reaching horizontal phenomenon with consequences in all areas of productive and also individual activities. To some extent it looks something like the introduction and diffusion of electricity, and is likely to be more than a standard technological revolution like new technologies in the chemical industry or new materials or maybe even bio-technologies, although bio-technology developments raise fairly broad questions. From this point of view it is not correct to look at the diffusion of information technologies like the introduction of continuous casting in the steel industry, which has been a huge improvement to productivity but also a huge substitution of labour with capital. What we are discussing this morning is a number of technologies which are going to profoundly change the organisation of work, in particular by reducing the problem of distance and reducing a lot of the problems of time in communication. They are also going to create the emergence of a very very large range of new services that will not substitute existing services. When we form the regulatory framework for telecommunication we are not suppressing one sector and doing nothing else. You know very well in the United Kingdom, there is statistical evidence in Sweden, there is statistical evidence in Finland as well, that in the telecommunication sector, in the strict sense of the word, total employment today is higher than before the sector was deregulated but, of course, you have to take into account the sector in its complete definition today. Narrow telephoning today employs fewer people than it used to ten years ago but narrow telephoning is now one of the many services which a deregulated telecommunication sector can provide. This is obviously true for the whole range of services which are not, strictly speaking, telecom services, which are becoming more and more available, which tend to be considered as broadcasting services in the old definition, but there again the exact value of what is broadcasting is going to fade progressively. All those activities are very very heavily labour intensive. Of course, as usual in the case of large-scale economic shocks, there are problems because the kind of manpower that new activities are looking for is the kind of manpower which tends to have fewer employment opportunities because of the structural change. In other words, it is true that there will be losses of employment, but it is equally true that there will be significant phenomena of employment creation. Evidence available shows that the net balance is positive and, if a number of conditions are met, strongly positive. Among the conditions to be met are all the measures which affect

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the extent to which new demands can express themselves. If government, for instance, (and let us not forget that the public sector presents in our countries between 40 and 50 per cent of GDP) decides to introduce in its own sectors of activity an extensive exploitation of new services, the potential for such new service delivery, even if this is spread over seven years or ten years, is enormous. If a strong effort is made within existing education budgets to introduce new technology as an educational tool then the potential for developing new educational content and programme is enormous. To come back in a final loop, if I may, to one of your previous observations, we have one particular R&D programme called Telematics, which is a programme whereby we try to finance for demonstration purposes new examples of application of existing technologies, not new technologies, or at least technologies which are available on the shelves, in the labs of the main equipment manufacturers like Ericsson, Nokia, etc. We concentrate those interventions through a form of financial support exclusively in areas in which new applications can be imagined with an immediate societal value, assistance to handicapped people, assistance to elderly people, management of health care centres, role navigation assistance, education and multi-media products. There are a few others but those are the ones I have in mind. We may call for tenders on the basis of objectives we would like to promote in which we would like to explore the extent to which new applications can be imagined. The result is that for all projects and all calls for tenders for this Telematics programme, the factor of over-subscription of what we can finance and what is being asked for by the private sector, always the private sector, is between 15 and 20. That means that the potential for creation of new services which are again almost exclusively heavily manpower intensive/labour intensive is very very large. I pick up this example because we ourselves concentrate in this programme, which is not a huge programme, on societal issues, in other words, issues in which either government at national level, regional level or the level of municipalities can play a key role. If those conditions are met I do not think there is any worry at all over the employment impact of the emergence of the information society, but in this case, like in any other structural change, if you multiply mechanisms of protection you freeze a situation and at the end of the day you are left with the negative consequences and a small range of positive effects but that is not particular to this sector.

Chairman] Thank you very much indeed. I am afraid we shall have to leave it there. We most grateful to you for that most illuminating evidence. Thank you.

Memorandum by the European Commission, Directorate-General XIII

R VERRUE'S ORAL EVIDENCE AT THE HOUSE OF LORDS, LONDON, 7 MAY 1996

Summary of contributions

INTRODUCTION

Our industrial societies are undergoing dramatic changes. They are entering the post-industrial era. They are moving away from a situation where economies are dominated by the production of manufactured goods to a situation where most growth and employment is being contributed by services, and particularly by activities involving the creation, processing and dissemination of information.

It is a period of transition, which, by essence, is characterised by:

- risks and uncertainties;
- rethinking and rebuilding;
- de-regulation and re-regulation;
- new skills and mobility.

Such a period of complex and difficult change challenges our social and cultural heritage: what should be changed, what should be kept, what should be promoted?

Because of the critical political and socio-economic importance of these far reaching changes, we need to:

- reach a common understanding of the underlying transformations;
- reach a common vision to act.

1. So your first question is well founded: how does the European approach differ from that of other regions of the world? How does it fit the current evolution towards a "Global Information Society"?

While our partners' strategies emphasise the economic and technological dimension of information infrastructures, the Union's view is that information infrastructures have social, societal, cultural and linguistic implications that must be fully taken into account in the formulation of its strategy: the Union has therefore developed the concept of "information society", which takes into account both the techno-economic and the social and cultural dimension of information infrastructures.

The concept of information society was endorsed by our partners at the G7 Ministerial Conference on the information society hosted by the Commission in February 1995. Consensus also emerged on a series of core principles which aim at striking a balance between the leading role of the private sector and government's duty to lift obstacles to private investment while promoting equal access and opportunity as well as cultural and linguistic diversity.

Other European differences are linked to the specificity of the Union's institutional organisation. Like any other policy or action, the information society strategy must respect the principles of subsidiarity and economic and social cohesion.

2. The information society will be a knowledge-based economy. The increased value of knowledge will mean that we will have to address the new challenges brought about by digital technologies in the field of copyright and intellectual property rights, as put forward in question 2:

Digitisation has given rise to concerns as to whether intellectual property rights, particularly copyrights, can be effectively protected because of the ease and accuracy with which information can be reproduced and disseminated. On the other hand, it is precisely this new facility of communications which is prompting the emergence of the information society and its numerous social and economic benefits. The challenge for regulators is to find a solution that meets these opposite requirements. Paradoxically, digital technology itself provide technical solutions, for instance through encryption, copyright identifiers and electronic copyright management systems (ECMS).

Following the publication of the Green Paper in July 1995, the Commission has received a very large number of comments and submissions. The analysis of all this information is almost complete, and the Commission will be publishing a formal Communication to the Council and European Parliament in the next few months.

The USA, Canada and Japan have all initiated their own policy making process in the field of IPRs and the results are coming together in the current discussions in the World Intellectual Property Organisation (WIPO) about the so-called "digital agenda". WIPO's role, already very important in the past, will be crucial in the context of global networks. A WIPO Conference on the digital agenda is planned for December 1996.

3. With the convergence phenomena triggered by digital technologies we face many other legal, regulatory and industrial challenges, as correctly stated in question 3:

Digitisation, by allowing to put information of a different nature (sound, text, video) which so far corresponded to different means of storage and dissemination into a common format, removes technological barriers between traditionally distinct sectors (computers, telecommunications, consumer electronics and content), thus allowing them to converge into a single multimedia industry.

Convergence has already triggered restructuring efforts across the different industries involved. A massive wave of defensive and offensive alliances, mergers and acquisitions is under way in order to share out costs and risks. However, the success of convergence will ultimately depend on the actual emergence of a new high-growth multimedia market.

Yet the current separate treatment in most Member States between broadcasting and telecommunications could lead to a lack of coherence in the future, as it will become increasingly difficult to distinguish between broadcast services with an interactive component from telecommunications services with a broadcast or video-based component. For instance, quasi-broadcast services such as video-on-demand (VoD) and broadcast services such as near video-on-demand (NVoD)—one delivered by telecoms networks, the other by broadcasters—would be covered by different rules, though they are essentially the same from the consumer's point of view.

The challenge for regulators is to realise the potential benefits of convergence by integrating historically separate regulatory frameworks in a manner that is neutral and transparent. A Communication on the issue of convergence of audiovisual and telecommunications will be prepared by the Commission in 1996.

4. and 5. Questions 4 and 5 refer to the development of new services, what forms they are likely to take, how they will be provided and what regulations should be envisaged.

Beyond the telephone, the TV set and the PC, new digital services cover a wide spectrum of applications at different stages of development, some already fully operational, some still in their testing stages, some yet to be developed.

The development of the new services will be market-driven, which is the safest way to ensure that they meet the expectations and needs of consumers, whether they are private persons, businesses or public institutions. The role of the Commission is therefore not to decide for the industry what form new services should take. Rather, its role is to remove regulatory barriers to private investment.

Therefore, regulation of new services should be limited to what can be demonstrated as necessary to enable and support competition. In addition, public authorities may have a role to play in the take-off of new services in areas of collective interest such as health care, education and training, traffic management, the environment, government user-friendliness, libraries and museums, etc. Involvement of the most appropriate government level, whether local, regional, national and in some cases European, is required to ensure that the new services are as close as possible to users' needs.

In terms of delivery, new services are and will be provided to the business and customer communities by a number of gradually converging networks: cable, telephone, satellite, private corporate, PCS/PCN, the Internet. Driven by a separate technologies and commercial rational, these networks are each gradually increasing in bandwidth and connectivity, and each evolving towards "superhighway status". They are also converging not only in terms of technical standards.

Hence, at European level, new services will be delivered to users over a trans-European information infrastructure or "network of networks". The interconnectability and interoperability of this trans-European architecture will be ensured through appropriate legislation at European Union level. The same approach will prevail at a global level in order to foster the emergence of a global information infrastructure.

6. Of critical importance to allow new services to be supplied are the confidentiality and the security requirements, two issues which are raised in question 6. Let me first recall you that the Commission's Action Plan envisaged several measures aimed at responding to the needs for confidentiality and security for new services in the Information Society.

As foreseen in the Action Plan, a Communication to the Council and the European Parliament has now been prepared in conjunction with a proposal for a Council Decision aimed at establishing a European network of Trusted Third Party Services. Such a network is now widely seen as the most appropriate way to provide an infrastructure for the development and use of encryption technology, especially for electronic commerce.

Although the confidentiality aspect is most important, by far the greater need, within the commercial environment, is believed to be for a secure replacement for traditional hand-written signatures. So-called "digital signature" provides reliable authentication of the originators of transactions as well as ensuring the integrity of contents of message; both to a very high level of assurance. Use of the proposed infrastructure will meet all of these objectives in the most satisfactory way.

Moreover, later this year, the Commission intends to bring forward a further proposal for a Directive which will address the particular issues associated with which will address the recognition of Digital Signature in all Member States. The Commission is mindful of the consequences for both law enforcement and national security which can arise by making encryption technology available without adequate safeguards. The Commission Proposal, whilst not directly addressing these requirements, will certainly ensure that these most important considerations are taken fully into account.

7. As suggested by question 7, the information society presents both an opportunity and a challenge for public authorities, whether at a national, regional or local level.

Indeed, while the information society can significantly the operation of government and public services, it will all depend upon government's ability to both understand the potential offered by the new technology and actually use it in the best possible way.

Information infrastructures can in particular boost government's user-friendliness and openness. On-line government or electronic kiosks located in public areas can for instance facilitate access to public officials and public records. Just as the use of ICTs are a key to business competitiveness, their use in the public sphere can also significantly improve efficiency and cut costs of public services.

Cities and regions are, because they are the levels of government which are the closest to the citizen, are best suited to understand and meet people's social, economic and cultural expectations in the context of the information society. They must therefore take a lead in formulating sound and user-oriented objectives for their communities and establish of partnerships amongst local and regional social and business actors.

The information society also offers the prospect of reducing regional and local disparities across the Union by overcoming the lack of availability of public services or educational and training facilities. Yet different levels of network developments between rich and less-favoured regions may be an obstacle. To overcome this problem and promote social and economic cohesion, the Commission supports bottom-up initiatives of local and regional authorities through its existing instruments, ie R & D programmes, trans-European telecoms networks and the structural funds.

8. I acknowledge that the development of new services face limiting factors, in particular, in the field of the valorisation of multimedia content and the exploitation of venture capital, as mentioned in question 8.

Europe possesses a rich and diverse cultural heritage, has a strong publishing industry and a well educated user community. Action is necessary however to ensure that these basic strengths are adapted in such a way that full benefits can be drawn from the transformation towards a European information society. The main limiting factors arise from the way the market is structured, the way the industry is structured, and the difficulty to access flexible financing.

European content markets are more fragmented along cultural, linguistic and national lines than those in the USA. In contrast, the US markets benefit from large economies of scale and scope provided by a larger and more homogenous market, a dominant language providing easy access to export markets, speedier infrastructure development backed by a strong hardware and software industry, lower communication costs, and a strong audiovisual production and distribution sector.

As regards industry structure, the key US convergence players are content producers, computers and software manufacturers and telecommunications groups. All of them have the huge financial resources required to realise risk ventures. In Europe, content producers and the computer industry are weak. The key players are broadcasters, publishers and telecommunications operators. The latter are the most financially well-endowed, a position derived mainly from monopoly rents. Yet they have so far been unable to channel surplus cash into developing business in areas of future promise in adjacent convergence sectors. One of the important benefits of liberalisation is that it will give operators freedom of action to pursue opportunities hitherto closed to them.

With regard to flexibility of access to money, compared with their US counterparts, European emergent companies in the multimedia and software fields are faced with a serious shortage of venture capital. US start-up companies can tap a range of sources of finance adapted to the successive stages of product development. The real challenge for Europe is to increase the diversity of sources of financing, and find mechanisms to offset the absence of venture capital.

9. When viewing the future of the European multimedia industry, we cannot avoid your question 9 on the dominance of US content and whether the European cultural and linguistic diversities is a handicap or an advantage.

If US content is dominant, then we should try to catch up and learn from their experience to do better, knowing that the overwhelming quantity, quality and diversity of European cultural assets represents a substantial value which offers itself be valorised and exploited. This is particularly true as the information society allows to move from the era of mass media to the era of tailor-made services and products, where cultural and linguistic closeness to the final user will become a key factor of growth, especially at local and regional level.

The solution must come from achieving a production cost which is substantially the same as for more homogeneous markets by mobilising the appropriate skills and the language technology, and ensuring a prompt adequate uptake by business. Thus we should be able to achieve a more competitive positioning of European business in the global market, which will remain linguistically and culturally diverse.

The Union's R&D programme are moving in these directions, namely with actions of the Language Engineering and Libraries sector of the Telematics Application programme. In the future these efforts should be stepped up, in particular with the follow-up to Language Engineering and to Telematics for Libraries, and the recently proposed Multi-Lingual Information Society initiative.

10. The three key factors in the development of the "Global Information Society", ie, convergence, competition and globalisation, impact directly upon the issue of standardisation raised by question 10:

As a consequence of convergence, standards need to integrate the requirements of all the convergence sectors in order to achieve compatibility and to avoid duplication. Common structures from standardisation organisations, official or not, have been created to cope with the need of coordinate standards; Joint Technical Committee Nr1 (JTC-1) from ISO and ITU-T; Information and Communication Technology (ICT) Strategy Board from CEN/CENELEC and ETSI.

The opening to competition of the communication activities modifies fundamentally the standardisation process. Previously used within a protected environment, standards now face a market-driven environment where market demand has replaced the fixed offer. Official standards compete with "de facto" standards drawn up by a forum or a consortium with vested interests. The basic requirements of standards, such as openness and consensus building, need therefore to be achieved by internal rules to meet by the standardisation organisations. Standardisation bodies launched internal restructuring in order to adapt their capability of rapid development to the multimedia needs.

The information society will be global, which implies the use of common standards. Market Globalisation favours the implementation of global standards which do not necessarily meet the required criteria to have full acceptance from all parties. In order market distortion, proprietary standards need to be taken over by an organisation which ensure a consensus on its content and usuage. In this respect, the official international standards organisations ISO, IEC, ITU, as well as the Internet Engineering Task Force, the Open Group, the ATM Forum, the Digital Audio Visual Council (DAVIC) and many others have a key role to play. Nevertheless regional organisations such as ETSI, EWOS, ANSI and CEN/CENELEC also actively contribute to global standardisation.

The terms and conditions under which such IPR can be used in the standard making process and its availability for use in the market once the standard is adopted is consequently a critical element of the necessary degree of openness in the information society from the point of view both of interoperability and competition.

Following the G7 Conference on the information society, it can be appropriate to dedicate a new one on the needs for ICT standardisation. It will be necessary to resolve the differences in approach which still exist between the principal international players in this field. Particularly in so far as Europe tends to give greater priority than the United States to open standards for the purposes of interoperability and competition. These diffirences are however less accentuated today than they were a few years ago, and an international consensus is now possible.

11. An important issue in the context of new services, in particular the Internet, is, as raised in question 11, whether there is a need to regulate content and whether such regulation is feasible:

On-line services, unlike broadcast services, are not designed for simultaneous reception, nevertheless their character seems more public than private. This "publicness" appears to justify controls but this control can be exercised by the users through filtering systems (possibly based on rating of sites). In some areas (eg TV without Frontiers Directive), it has been possible to harmonise some aspects of national approaches at EU level. A similar approach may eventually be needed for new services, but is too early today.

As regards the Internet, indesirable content such as extreme pornography, incitement to racial hatred, which currently constitute a very small proportion of Internet traffic, attracts legitimate concerns. Many countries around the world are starting to assert jurisdiction over Internet activities, or are considering doing so. Indeed, it is no longer possible to ignore activity on the Internet. However, we should avoid any over reaction, which might block the emerging services and thereby slow down development of the information society.

The same principles as for printed matter, videos, could apply to the Internet. However, corrective regulatory measures by public authorities without consideration of their feasibility, proportionality or their impact on the potential growth of new services. In other terms, regulation must be enforceable and at the same time recognise the global nature of the Internet and the absence of any single controlling entity.

In the EU context, some degree of harmonisation may be appropriate (eg in areas such as protection of minors or advertising) to avoid a fragmentation of the internal market. A multilateral approach is also necessary, given that considerable amounts of content currently originate outside the EU. A rethink of the overall regulatory environment is called for, rather than piecemeal approaches to immediate problems. The Commission is working to develop such an overall approach to convergence issues, and will be reporting on the matter by year end.

12. Our efforts to implement the information society is of course motivated by our common political will to create the highest possible number of well paid jobs and I am glad to have the opportunity to answer your question 12 on the impact of the information society on work practices and employment.

Whatever the considered sector, the introduction of information and communications technologies in the workplace will deeply modify structures, roles and competencies, thus leading to a reconfiguration of all activities, whether at the management, manufacturing or marketing level. Following is an overview of expected key impacts:

— new ways of working, as for instance teleworking, mobility and the nomad or virtual office, will increase flexibility through looser working schedules, the diminishing importance of a given working place and the blurring of the strict separation between professional and private life;

— decentralisation will increase, as is already indicated by the shift towards outsourcing, externalisation, downsizing and devolved hierarchies;

— while the importance of specialised and technological skills will continue to increase, a number of new social skills will gain momentum, for instance communication, team working or polyvalence;

— there will be a trend towards flatter hierarchies, where collaborative work gains momentum over hierarchical relations.

These changes in the workplace also require changes in the social sphere, in particular:

— employees, in particular the less-qualified, will have to be offered training opportunities to adapt to the new work organisation and perform new tasks;

— new wage systems and procedures of social dialogue are required to make sure that greater flexibility doesn't lead to increased precariousness and a downgrading of social protection and working conditions.

— education and training schemes will have to take into account both the necessity to familiarise workers with ICT and the emergence of new social skills.

Past experience shows that any important technological progress results in the destruction of redundant professions and tasks while at the same time prompting the appearance of new activities and jobs, both directly through the emergence of new products or services and indirectly through the dissemination of productivity gains across the economy.

The massive computerisation and automation launched in the 1970s had a restructuring impact mostly through the substitution of capital for human labour. But unlike stand-alone information technologies, ICTs are likely to have a more positive macro-economic impact through the so called "network effect". The network effect removes contraints of time and space both as regards market reach, the localisation of production and the dissemination of innovation, thus benefiting the entire economy.

The network effect combined with the positive impact of liberalisation on investment and the emergence of new markets will contribute to create new jobs both directly and indirectly to create new jobs. Yet this process will take some time, and there could be a job deficit in the short term. In addition, new jobs may not be created where the old ones have been destroyed. Hence the need of adequate re-training schemes.

R Verrue

Director General European Commission DG XIII

Brussels

5 May 1996

TUESDAY 14 MAY 1996

Present:

Butterworth, L.	Haskel, L.
Craig of Radley, L.	Hogg, B.
Flowers, L.	Phillips of Ellesmere, L. (Chairman)

Memorandum by the Technology Foresight Information Technology, Electronics and Communications Panel

INTRODUCTION

In a few years' time the Information Superhighway will be as essential to economic life as the telephone is now. Our objective in giving evidence to the Select Committee is to stress just how important a competitive superhighway environment will be, and to urge that the policies and investment needed to deliver it should be a major Government priority.

THE BUSINESS FRAMEWORK

The superhighway is crucial to our continuing success as a place to do business. We therefore need a globally attractive superhighway environment, with a regulatory framework (for commercial law, IPR, security, payment, etc) which allows providers to make a return on their investment.

THE PERSONAL FRAMEWORK

We need to encourage people to adopt the superhighway as part of their daily lives. Many people are already accessing the Web at work, but we do not yet have a framework of services which add up to a compelling reason to connect at home. The current Information Society Initiative is aimed at small and medium enterprises—we need similar initiatives aimed at our citizens. We also need greater access in education, and better community access.

BACKGROUND

The Technology Foresight programme was announced in the 1993 White Paper "Realising Our Potential". The programme brings together senior industrialists and academics, scientists and engineers to identify how the UK can best take advantage of the markets and technologies likely to emerge during the next 10 to 20 years, and the investments and actions necessary to exploit them. The focus is both quantitative (wealth creation, including job creation and maintenance) and qualitative (quality of life). The results of Foresight will inform spending decisions made by Government and industry. It should also help small and medium-sized businesses which do not have the resources to undertake their own strategic assessment.

IT & Electronics and Communications were originally two separate panels, but have merged to reflect the reality of the rapidly converging technologies and markets. Our reports were published in April 1995, and contain 26 recommendations which we believe are essential to maintain a competitive ITEC economy in the UK. This paper focuses specifically on our thoughts about the Information Superhighway.

ITEC IN THE GLOBAL ECONOMY

ITEC will be one of the biggest global industries by 2000, and because it is an enabling technology which underpins most other industrial sectors it is also the most important. The US Council on Competitiveness identified the 100 most critical technologies in all disciplines and 55 (ie more than half) were ITEC topics.

We are moving to a global economy in which geography will be an irrelevance in many investment decisions. Countries do not compete in many ways, but they do compete to attract and retain business. The UK will be competing with low-wage countries which have never before featured as viable places to do business. IT infrastructure will be more important than any other element in attracting and retaining business, and the Information Superhighway will be the most important element of the IT infrastructure (which we take to mean not just the underlying physical infrastructure, important though that is, but going right up to the services and applications levels of the architecture). If we get this right we will be well placed to compete in the new global market. If we get it wrong we will facilitate a gradual but inexorably rising export market in jobs.

The Technical Infrastructure

A viable infrastructure is essential if we are to use the Superhighway to help in generating wealth. The Select Committee will have taken detailed evidence from the providers and other interest groups about the bits and bytes of the various technical options, and this is not an area which we want to address in detail. However, the emerging information infrastructure will demand very high bandwidth access communications for the end user, as demonstrated by the time it takes to transfer information by modem.

	Dial Up (14.4 kbps)	*ISDN (64kbps)*	*ADSL (2 Mbps)*	*Data over cable (4 Mbps)*
Full screen World Wide Web image (2 Mb)	2.3 minutes	31.3 seconds	1 second	0.5 second
Half A4 page photo-quality print (16 Mb)	18.5 minutes	4.2 minutes	8 seconds	4 seconds
Short animation/video (72 Mb)	1.4 hours	18.8 minutes	36 seconds	18 seconds
Long animation/video (4.3 Gb)	3.5 days	18.7 hours	36 minutes	18 minutes

As the table shows, ISDN (Integrated Services Digital Network) is only viable for short-term, non-media-intense applications, ADSI, (Asymetric Digital Subscriber Loop) is marginal, and the future lies with broadband access technologies such as cable, radio and satellite.

Much of the focus on superhighway technology has been on hardware and networks, but this is far from the whole story. Software advances have not kept pace with the other technologies, and current software will not support the full potential which could be offered by the superhighway. For example:

- networks will not be centrally managed and users will make mistakes, so systems must be robust;
- programming methodologies, tools and environments must improve to make development faster, interfaces more user-friendly, and systems easier to change;
- systems must be developed to improve handling with media and broadband networks.

The Foresight panel recommended a 10 year collaboration between industry and academia to produce a distributed information management framework which would address these issues and could be made available to UK industry. Responsibility for taking the recommendation forward has been accepted by Government, but the significance of the advantages that this programme would bestow appears not to have been properly recognised, and progress has stalled.

Superhighway Deployment

The superhighway will force major changes to the way we do business—the Internet is already growing at 10 per cent a month. Information businesses will offer new kinds of electronic information products and services over the communication networks. Obvious examples are tele-shopping, tele-healthcare, financial services, and surveillance, but in fact all service businesses have infobusiness potential. In particular, we think that there are significant expansion opportunities for existing world-class niche companies which until now have had a restricted market place. The UK economy is already dominated by the service sector, which means that there is a significant threat that a large proportion of it could go elsewhere. The high price of end-user communications access is a serious deterrent to exploitation of the new paradigms in Europe compared to the US. (The opening of the European telecommunications market in 1998 may help improve European competitiveness and, while there are aspects of the UK telecommunications regime that need to evolve, the UK is more developed than most other countries except the USA.) Fortunately we also have significant strengths which make the UK an attractive place to stay and develop infobusinesses if the environment is in place:

- strengths in "content production" such as film, animation, publishing and the arts;
- access to huge English archives and material;
- well developed global industries which are ripe for infobusiness exploitation.

These would have to be developed from scratch in many competing countries, which make the economies less attractive, (but not unattractive).

The type of broadband communications which constitute the Information Superhighway will evolve as the technology and services develop.

Inside Organisations—the "Intranet"

Many large multi-nationals have already adopted Internet and World Wide Web technology for their own internal computer networks in preference to older proprietary standards and systems. This enables them to exploit all the latest WWW and browser technology for the employees doing day-to-day business within the company.

ORGANISATION TO ORGANISATION

Once organisations are using the same WWW/Internet technologies internally it is easy for them to communicate via the Superhighway as it develops, and do business-to-business communication much cheaper than using proprietary solutions such as Electronic Data Interchange. For example, most retail companies already have automated stock systems linked to tills. The next step is for the stock control system to send orders automatically to the suppliers, for the suppliers to bill automatically for supplies, and for the bills to be paid by electronic transfer of funds. Superhighway bandwidth is not necessary for individual transactions of this type, but will be needed to handle the likely volume.

ORGANISATION TO INDIVIDUAL (CUSTOMER, EMPLOYEE ETC)

The superhighway concept is already driving the introduction of the communications infrastructure towards the individual. Like the telephone, this will offer new opportunities (such as tele-working) when a critical mass of people are connected. This will eventually be achieved by market forces, but we would like to see it happen as soon as possible. One way to encourage this is for the Government to promote a cultural shift by publishing more information on the Web, and providing e-mail access for routine communication with Government such as VAT and Income Tax returns.

INDIVIDUAL TO INDIVIDUAL

Eventually we think that most people will have access at home, and will be able to use the Superhighway for infobusiness, "edutainment", work and fun. The very poor and the unemployed are likely to be excluded from this, and are likely to be significantly disadvantaged, just as people who cannot afford a telephone now are disadvantaged in the hunt for work. This needs further thought, but we hope that some type of public provision could be made to offset this. For example, what is meant by Universal Services Obligation will necessarily need to evolve, with implications for the administration of the Universal Service Fund proposed to replace the Universal Service Obligation that currently applies to BT alone. Public access points such as libraries might have to provide not only free access to equipment but free communications access as well.

THE BUSINESS INFRASTRUCTURE

The emerging information infrastructure will:

- accelerate international trade in services and electronic goods eg entertainment;
- change the balance between large companies and small companies in many industries;
- radically alter value chains and means of distribution;
- encourage geographic shifts away from current centres of production and trading;
- enable radically different ways of doing business and many new kinds of E-business.

Business will be international or global in scope, but the parameters which support business are often treated at a local or regional level. It is essential to have a business environment which is as consistent as possible across Europe, and with developments in the US and other parts of the world.

LEGAL

Legal frameworks have to be defined for all cross-border commerce, but the speed with which electronic transactions are conducted means that they are more significant in this context. The most important issue is commercial contract law.

A major inhibitor in the development of information-based industries is the way intellectual property rights can be handled. There are crucial questions here that need to be addressed on a European, if not on a global, scale. The handling of this issue will be key to facilitating or retarding the development of true content-based multimedia services.

In the case of on-line business trading electronic goods there is also the question of which jurisdictions apply in any given trade. Suppliers, purchasers and traders of electronic goods on the Internet know no geographic boundaries. This will affect legal definitions such as:

- origin of goods and services
- applicable regulations and laws
- where the profit is made
- where VAT should be paid.

Secure payment mechanisms are a major issue in E-business, both within national boundaries and internationally. Secure end-to-end payment mechanisms are essential.

REGULATION

The Bangemann report identified Telecom deregulation as a critical requirement for rapid development of the Information Society. The EU is promoting deregulation, but Europe is trailing badly behind the US in providing an affordable communications infrastructure—for example, setting up cross-border communications networks is still difficult and expensive in Europe. While the opening of the European telecommunications service market in 1998 will help, more, and more rapid, progress is vital if we are to be able to catch up and compete on an equal footing with the Americans.

STANDARDS

The most successful standardisation activities are driven by industry groups which are striving to create a market, and focus on solving specific, well-scoped problems. This type of *de-facto* standardisation activity will normally deliver faster, more relevant solutions than a *de-jure* approach, and should be encouraged.

Many important standards development processes are dominated by US companies and institutions. For example, the Computer Systems Policy Project (CSPP) consists of the top 13 US computer companies, and meets regularly at both Chief Executive and Chief Technology Officer level to define work on standards and policy. Much of the valuable work which has been done under the US GII initiative has been undertaken by this body. It is pointless to set up alternative national definition procedures, and the government should be trying to encourage European stakeholders to participate in the *de-facto* standard-setting being undertaken through industry groups. The main exception to this is in the development of interoperability issues, where agreement is needed within the framework of the optional elements of the available and emergent standards, and where action at a national level is appropriate because the UK telecommunications networks and services market is more advanced than for other European markets.

ENCRYPTION AND SECURITY

Governments tend to view security as national issue, but this approach is making it difficult for companies operating internationally to secure their data transmissions across national boundaries. High-grade, secure end-to-end security which is not accessible to Government (except via due legal process analogous to seach/surveillance warrants issued by the police and courts, through an agreed escrow process) is an essential element in creating an attractive environment for global business. We also need fine-grain security within large networked systems (including public sector systems) to allow the enforcement of individual privacy. For example, the BMA have recently expressed concern about possible misuses of data on the new Government medical records network.

EDUCATION AND TRAINING

Two key elements that will work as a major brake on the full implementation of the information superhighway in the UK are to do with the level of ITEC skills in the community. The World Competitiveness Report 1994 (a leading study on the competitiveness of nations by the International Institute for Management Development, Lausanne) ranks the UK 14th in the world and ninth in Europe, but we come only 21st on "people" (education, willingness to retrain, in-company training etc) across all industries, and 21st in "computer literacy among employees".

A major concern identifed by many of the Technology Foresight sector panels, not just the ITEC panel, is the supply of suitable ITEC-literate employees at technician level. These are the people who will be able to implement solutions in user industries. It is vital to increase the number of students going through enhancement and training courses which provide these skills.

Skill shortages at the technician level are part of a very much greater problem identified in both the IT & Electronics and Communications Panels' reports—the need to improve IT awareness in schools. The Panels concluded that it was necessary to develop computer literacy through hands-on experience by using IT in the general education process. Most discussions about this appear to focus on the provision of hardware, but success of any initiative will depend crucially on the availability of suitably trained teachers and curriculum material and software. The panel has called upon the Government to play a leading role in sponsoring this provision.

Other European nations have created programmes to create online cities, and are facilitating the cultural changes which will alter the way that people think about living and working. The UK is behind these other countries, and is falling further behind. For example, we have proportionally fewer cybercafés, libraries and schools, and much lower awareness of how the superhighway can be put to work. The UK needs a programme to create an on-line nation.

ITEC Panel

3 May 1996

Examination of witnesses

DR JOHN M TAYLOR OBE FEng FIEE FBCS, Director, Hewlett Packard Research Laboratories Europe and Chairman, Technology Foresight ITEC Panel, PROFESSOR RODGER B HAKE, Technical Director, British Computer Society and Vice Chairman, ITEC Panel, MR MARTIN WARD, Technical Director, GPT Ltd and Member, ITEC Panel and PROFESSOR JOHN O'REILLY, Chair of Telecommunications, Department of Electronic and Electrical Engineering, UCL, and Member, ITEC Panel, called in and examined.

Chairman

656. Good morning, Dr Taylor and colleagues. Perhaps you would like to begin by introducing yourself and your colleagues and then making any preliminary statement that you think would help us.

(*Dr Taylor*) Thank you very much, my Lord Chairman. My name is John Taylor. I am Chairman of the Technology Foresight Panel on Information Technology Electronics and Communications. My colleagues here are all members of that Technology Foresight Panel: Professor John O'Reilly from University College, London; Professor Rodger Hake, late of IBM but now from the British Computer Society, and Mr Martin Ward from GPT. We very much appreciate the opportunity to give evidence to you this morning. We would like to make a very short introductory statement but we very much welcomed the questions that you sent to us. They seem to cover our concerns very well and we have again some very brief initial statements about each of those question areas if that would be an acceptable way forward. The Information Superhighway is a term that has been much hyped. We agree with the broad definition that we see in various of the papers that have been submitted to you already. For us, it is not just the Internet. One way of thinking of it, very crudely, is it is the beginnings of building the phone network for computers, the pervasive digital infrastructure that will eventually let most computers, whatever they are in a few years' time, talk to each other in a way that until very recently they could not even begin to think about. We are talking about the evolution of a pervasive digital communications utility. The Internet, over the last couple of years, has been a very discontinuous phenomenon where this connectivity has just gone to critical mass for the first time. A few years ago, most personal computers could not talk to anything much except maybe a printer. In a few years' time, most of them will be able to talk to a very large number of other machines. For us, the Superhighway is a very long term topic. It is not all going to be done this financial year, despite the hype. Also for sure it is not going to go away. Whether we like it or not, it is something that is here to stay. As far as the topic of your investigation, applications in society, we see things in two very clear camps. Things to do with enterprises, what organisations do and how they will be affected by it, and things to do with people, with individuals, and how they will be affected by it. As we said in our written evidence, we see essentially four main stages of development of this happening maybe over the next ten years. First of all, the phenomenon of the Intranet. That is, using this common, state of the art technology inside an organisation instead of all the old, heavy duty proprietary stuff. That is happening quite quickly at the moment in various areas. There are leaders; there are laggards, but it is underway. Once that is in place, then the second step of enterprise to enterprise communication via this evolving infrastructure becomes much easier. The barrier to communication, the barrier to interaction, is much lower than it is with proprietary, heavy duty systems for doing business to business interaction. The third stage is the enterprise to the individual. The individual can play several different roles: employee, customer, and we see that once this stage begins then people will find many new ways of marketing to and accessing customers and many new ways of allowing teleworking and remote working and so on, again with a much lower barrier to networking and entry. The final stage is citizen to citizen, individual to individual, community use. Again, we think that will develop as and when the infrastructure becomes pervasive enough and cheap enough. For sure in our minds those initial stages are underway right now and that sort of progression will probably take at least the next five to ten years to really become mainstream. That is what we would like to say in opening. If I may, I can then go to the first of your question areas and make a short statement about that and then maybe proceed to some discussion.

657. Dr Taylor, could I just ask you something about the rather elegant summary you have just given which emphasises Intranet a little more than it has been emphasised so far in our evidence? In that evolution from an Intranet in a company, many of which exist, to communication between such Intranets and, after that, communication between Intranets and individuals, stopping at that point, what do you think of the importance of fire walls between those Intranets, which industry is often rather concerned about, and the fire wall between the Intranet and the individual?

(*Dr Taylor*) Fire wall technology at the moment is very crude. It is at a very early stage because the

Chairman *contd.*]

overall design of the Intranets and the availability of so called end to end security technology is rather limited. One of the recommendations we would make very strongly is that we should really open up the availability of strong, end to end encryption to the mass of business, commercial users and so on as quickly as possible, subject to the right kind of safeguards. I do not think that the Internet could develop without the equivalent of sealed envelopes. If we tried to develop the postal service with just postcards, it might have been somewhat handicapped. The next main feature that we need to give is end to end security so that people can have a much higher degree of confidence in the fact that their information is protected. When that becomes available, we understand the design of fire walls and the networking will change. Fire walls at the moment are there on the basis that you have not got any other kind of security. When you have got other kinds of security, then the architecture changes and there will be quite a rapid evolution.

658. Would you like to go on with your statement?

(*Dr Taylor*) The first question was why did we see this Information Superhighway being as essential as the phone for the economy over the next few years. I hope we have partially sketched the reasons why we believe that so strongly already, but we believe that the technology should be thought of as essentially disruptive to many, if not most, enterprises. Two very quick examples might serve. One is if you imagine buying a music CD in the UK at the moment. If you spend about £12 or so, something like £5 of that £12 is for physical distribution. If you could distribute it electronically across some kind of network, then whoever was consuming that £5 on trucks, warehouses and so on is going to find things quite disruptive. To go to a further stage, if one imagines, say, an electronic version of Country Life with an electronic advert in it for, say, Marks & Spencer created by an electronic advertising agency, if you click on to the Marks & Spencer advert, you then see, for example, some animated pictures about some clothing which you might like; if you say, "I am interested in that", you could then reach into the Marks & Spencer computers and let them show you an image of what you might look like wearing that particular garment in that particular colour, having accessed your personal details from your personal Web page that is held somewhere in the system. If you decide you really would like to order that, then Marks & Spencer can reach into its supplier, wherever it is in the world, and say, "Make one of those and deliver it to DHL, Federal Express", or whatever, "for shipment to that individual and send the bill to Visa, Mastercard", or wherever. If that advert is in place for just one week, then those inter-enterprise, quite intimate relationships need to be able to come and go very easily and very quickly. We will either be the master of doing that or not. Basically, we think that this technology, as it evolves, will give people very ready access to global markets. I do not know if anyone has seen Lester Theroux's new book, The Future of Capitalism, which talks about our present organisation of business being around the ownership of means of production, means of distribution and so on, which are factories, machines and so on. When the means of production are increasingly brain powered, the way in which we organise business around brain power as the key asset is going to be a real dilemma in the information age. Again, understanding how to master this technology is going to be, we feel, crucial to the way the economy in a high value adding, developed country is going to operate.

Lord Haskel

659. Having spent 30 years in the textile and clothing business, I am terrified at the thought of getting an order from Marks & Spencer to make one of these, which leads me on to the point that I can understand what you say about the communication aspect but of course practically manufacturing is also going to have to move to make use of the Information Superhighway. I can see how manufacturing can make use of the Superhighway, as far as communications are concerned, but do you have anything in your Technology Foresight Report about how information technology could be used in manufacturing to in fact make one garment for Marks & Spencer?

(*Dr Taylor*) Let me respond briefly and then invite my colleagues to join in. I think there are many levels in the value chain where there are very clear examples of that from, for example, the ability to couple computer aided design technology much more intimately to mass customised single production, whether it is printing a particular fabric or whatever in a one-off, or very low batch, very individually customised production. For example, in the car industry, people say maybe quite soon no two vehicles will be the same because they will be customised for a particular order. Right through the understanding that is emerging very rapidly in the business process now is that managing the information value chain is as important as managing the physical goods value chain. As we, for example, get to the situation where you could put an invitation to tender on the Internet to produce 3,000 printed circuit boards or something and have an invitation replied to by many different companies almost anywhere, send them the information, interact very closely with them on quality matters, have the goods sent to you and that is the end of the relationship. I think there are many examples where those kind of virtual corporations, or virtual enterprises as they have it in the jargon, are really beginning to happen already.

(*Professor O'Reilly*) Slightly on the side of that, since you mentioned manufacturing, it is worth noting that we represent the IT, Electronics and Communications Foresight Panel but there was one on manufacturing—indeed, there were many. One of the most notable things I think that came out of Foresight was how strongly the network and those things which we were concerned with addressing featured in all the reports, including the manufacturing report. This issue of pervasiveness throughout society and so on is not just us, if you like, the vested interest in terms of the technologist, that is saying it. It has been said throughout the Foresight process.

Lord Craig of Radley

660. Do you see this concept of bespoke tailoring via the Internet, where you send your measurements perhaps not just to Marks & Spencer but to a whole variety of suppliers and they quote for you and so on, as a sort of extension of your phase one of this approach?

(*Dr Taylor*) Very much so. The early interactions between manufacturers and their customers are taking place quite interestingly in different parts of the net at the moment. One example is in the motor industry where certainly we have had a lot of dialogue with some of the big car companies who say, "We would quite like to go direct to our customers rather than through dealerships and form a long term relationship with that customer, understand his preferences", and so on. There is a kind of second hand market developing in California at the moment which has some interesting dynamics, because you can now discover what price you should ask for your second hand car by inspecting adverts very quickly. Then you can place your advert very quickly and find that your car is sold. This is terrifying people selling new cars because you can essentially put a personal invitation to tender out for the best price on the car you want. People who used to rely on competing on price are now really starting to try and understand how to compete on something else. For example, maybe, say, if you have the right kind of communications into your house or into your car, "We will monitor, manage and look after your car electronically for you after you have bought it from us". It is part of the service you get from your phone company or your power company or whatever. There are already some very serious dynamics coming into this.

661. Do you have a feel for how rapidly that sort of philosophy is going to develop? Is it more hype for some time in the future when it will come, or is it something for which you believe the seeds are now well sown and, with a little bit of watering and horticulture, they will blossom?

(*Dr Taylor*) I think it is a complex question, or a complex answer in a way. I am very sure that we have got past the killer application kind of stage. It is rich; it is diverse; it is fertile. If you look at what was happening in cable a few years ago, everybody was saying that video on demand was the only reason you would want to have anything like access to your home. That turned out not to be true, but I think in the last two years the diversity of different services, facilities and so on available on the Internet is really very remarkable. There will be early adopters, mainstream laggards; it will be different by geography, by culture, but I am absolutely sure that it is going to take off. The only questions are where and how fast. Those are individual judgments. It is just remarkable where you can do things like reserving hotel rooms in the depths of Somerset on the Internet right now. You really can.

(*Professor Hake*) I have actually got some figures that have come from the United States and a survey that was done last year on Internet penetration. They determined they had 37 million people in the 16-plus age group in the US and Canada who had Internet access, of which 2.5 million produce goods or services over the Internet, so it gives a measure of the penetration there which is relatively low compared with normal business methods.

662. Dr Taylor, you used the phrase "killer application". I think you are about the first witness who actually felt they had identified a killer application, even if it has not yet killed us.

(*Dr Taylor*) On the contrary, my Lord. I was trying to say exactly the opposite: that I am not looking for one killer application for this to be successful. The whole point is that it is so diverse that you do not need to. The key phenomenon that people are starting to understand is the shift from programmes, packages and application to content, to electronic stuff, and just the explosion in the amount of electronic material, as opposed to programmes, that is going to happen and that people are going to focus on.

Lord Flowers

663. Dr Taylor, you mentioned security and encryption and so on. Various people have talked to us about that. The medicals are worried about it naturally. Banks have talked to us about it and so on. You mentioned it in a rather interesting way, I thought, so I would like to ask you what level of security, what level of encryption, if that is the way you are going to go about it, would you accept? You mentioned the equivalent of a sealed envelope. If that is all you want, that is not very secure but if that is what will keep business happy it becomes a very simple problem.

(*Dr Taylor*) I think, in all seriousness, what is required is very high grade security and quite a diversity of it, subject to a similar level of accessibility to the proper investigating authorities via courts, warrants and so on as one has roughly at the present time. To give people low grade security is not only a complete waste of time but also a damaging thing to do because it gives people a very false sense of security.

664. That is what a sealed envelope is.

(*Dr Taylor*) Yes. On the other hand, you can sort of see if it has been tampered with by an amateur. The game is very different in the digital world. High grade security is going to be essential. I know a lot of international businesses who are very concerned that they are sending all their international traffic completely open, with no level of protection. People who are inclined to disregard the rules can go and buy high grade encryption right now and protect themselves, so I think that is going to be an inevitable development. I would personally very much welcome an acceleration of it, subject to proper controls. The notion of escrow, trusted third parties and the kind of Royal Holloway architecture that is coming on is a pretty good way.

665. Is pretty good privacy good enough?

(*Dr Taylor*) No.

666. It is not?

(*Dr Taylor*) Not really.

667. Not for ordinary businesses?

(*Dr Taylor*) The rate at which the processes that companies like mine are improving in their performance means that you have to be quite aggressive in the long term, thinking about it. The

Lord Flowers *contd.*]

rate at which processing power is increasing and is getting cheap means that I think you really have to have a policy of very strong encryption.

668. You are pushing towards military security for business operations?

(*Dr Taylor*) Yes.

(*Mr Ward*) I think the other thing to stress is that it is not just a UK national issue; it is a global issue.

Lord Butterworth

669. I wonder whether it was a bit unfortunate that we started with Marks & Spencer in the sense that one can see, if it is capital goods like a car or something of this kind, we may be very near to delivery of individual cars and indeed the car industry has gone quite a long way itself in anticipating this, but to what extent is this also true? What is the kind of likely delay of being able to order individual shirts or blouses from Marks & Spencer or whoever it may be? The car industry is very near to this now, is it not, through Cadcam and so on? They are on the brink of actually delivering?

(*Dr Taylor*) Yes.

670. What about the less expensive items?

(*Dr Taylor*) I think one of the reasons I picked that particular example is two-fold. One, is the Superhighway—not at very high speeds, I hasten to add—becomes quite pervasive, it offers new channels to a company like Marks & Spencer at potentially much lower cost than with some of the channels they are operating at the moment. The channels are quite attractive. It would be cheaper to reach somebody in certain ways. Secondly, the move towards manufacturing technology which indeed can either deliver a large variety of different components or supply you individual things to your own preference, is moving quite fast. I think there is going to be quite an attractiveness for many of the large companies to invest in that kind of manufacturing technology, in those kinds of channels, to differentiate themselves, to offer a way of having a relationship with the customer that the customer values in quite a new way.

671. It furthers their policy of no warehousing if they just send straight from the manufacturer to the customer.

(*Dr Taylor*) It is quite attractive, is it not?

Lord Craig of Radley

672. Could we go back for just a moment to the encryption issue, particularly how one might regulate it and what form of regulation regime should be applied? What ideas or recommendations have you on that?

(*Dr Taylor*) This is again a very complex topic. I will just skate the surface very briefly. I think the notion of trusted third parties is being explored in a number of different scenarios, not least, for example, with the major credit card companies at the moment, trying to understand how to broker between different businesses that do not know or trust each other. Having a single trusted third party is not practical for global business so you must be talking about a large network of trusted third parties that operates internationally. The thinking that is developing at the moment is about how that might be set up, how it might develop, how it might incorporate many different encryption algorithms, how it might deal with national boundaries and the kind of escrow procedures that you would have to say, "I will lodge the key material for this material and I will respond to a warrant"—from which country? Which jurisdiction? There is a lot to be thought through. Basically the notion that says, "I am willing to deposit the key material that will unlock this with a trusted third party who will in turn disclose it to the proper authorities with the proper authorisation" is the only way I can think of.

673. Do you envisage some sort of licensing for regulation of these escrow organisations?

(*Dr Taylor*) Yes, but again I think when we come on to regulations and government actions in this area it needs to be as lightweight, minimal and skeletal as possible. It needs to pick on just the things that it needs to prescribe and leave the rest to be negotiated.

Baroness Hogg

674. To follow through your analogy of the sealed envelope, which is very easy to open but, as you say, fairly obvious if it has been opened, at least by an amateur, is there an equivalent distinction in digital communications between the level of encryption needed to prevent people accessing information and systems architecture that makes it clear, either that someone has altered the information there—point one, or, perhaps less critically, that they have accessed it?

(*Dr Taylor*) One of the really important things about encryption technology is that actually ensuring confidentiality is perhaps, in many cases, the least important of its functions. Guaranteeing authentication, guaranteeing something tamper-proof, guaranteeing not being repeated and so on is as important, or more important. A very simple example of what is going to be necessary is this: if I publish something on the Web today, somebody can reach off the Web and get at this thing. They have no way of telling whether what they are reading is what I wrote. More importantly, I have no way of being sure that what they are reading is what I wrote. If somebody had just taken all the "nots" out, I might be rather upset, so people publishing anything are going to need, very shortly, the ability to say, "If you call that trusted third party, they will tell you whether you have the authentic copy of that or not". Again, you need strong encryption algorithms to deliver that because the weak ones are trivially easy to break. With computer power increasing so fast, you have to make long term conservative assumptions. It is extremely important for much more than just confidentiality.

Lord Flowers

675. Life could not continue unless most people were honest most of the time. Is it not a mistake to assume that everybody is going to be dishonest and build systems which are absolutely dishonesty proof?

Lord Flowers *contd.*]

It is a very expensive and complicated way to go about life.

(*Dr Taylor*) I think it is almost the other way round, if I may say so. The person is willing to say, "Yes, I will lodge my keys with an escrow trusted third party on the basis that I am not a crook. I am willing to do that but I want to be sure that my material is capable of being authenticated or protected or kept private against the one in a thousand crooks out there who will deploy serious resources to get inside my system." The systems we are building today are so enormously complicated. The worldwide telephone network, the worldwide Internet, as it will be in a few years' time, is just incredibly complicated and incredibly large and you are going to need levels of assurance that, when you put something into this network, you can be absolutely certain that nobody is going to be able to tamper with it.

Lord Haskel

676. On a point of information, you have been able to order individual suits on the Minitel in France now for over ten years. This system was extended to the UK to about 20 or 30 stores here and, because of the high mark-up in France, it was an economic success but here in the UK it has not been successful because of the much lower mark-ups. It is a much more complicated matter and it is a very interesting system where you do it with computer aided design. It is not straightforward.

(*Dr Taylor*) Absolutely. One tailpiece just on encryption again: I think one of the most important developments next in this whole environment is going to be what we call "image as data". If you imagined 100 million cameras on the Internet, if you wanted to know what the weather was like in Hawaii, you could grab an image and look; or if you wanted to know whether your front door was open or whether there was anybody in your living room, you could just go and look. Again, it is a question of to whom do you give the keys to your front door to allow someone to grab an image like that. This is going to become quite important. People are going to want serious safeguards, just as in the BMA case. If a doctor puts very confidential information into this enormous sea of networks, he needs to be pretty certain that it is proofed against the one in a thousand crooks who might just try to interfere with it.

Lord Flowers

677. May we go on to the probability of government action? If one says that the information infrastructure—I am glad you use words like that rather than "Superhighway"—is something to be encouraged, should the government be taking actions to encourage it? Should it be thinking about the regulatory structure? It has been put to us that the regulatory structure as at present designed is a barrier to progress. I would like to know what you think about that. Should there be some sort of content foresight initiative comparable to the technology foresight initiative? I think you know what I mean by the distinction?

(*Dr Taylor*) Yes, my Lord.

678. Should there be some sort of universal service obligation? These are things which the British government could show some initiative in. You might like to say what international framework might make that even more widely useful.

(*Dr Taylor*) Let me summarise the three or four points that we chose to highlight in response to that question and then I would be very happy to open it up to my colleagues. In terms of what specific government actions we would like to see happening or being accelerated, I think the first one is the UK taking a leading role in the international adoption of high grade encryption standards and frameworks with the appropriate safeguards along the lines we have described. I think that is the critical next step if we are going to be at the leading edge of exploiting this technology that is going to happen. We will get back to that when we talk about employment. Similarly, we would very much like to see the UK taking a leading role in developing the legal frameworks and the international property frameworks and so on that are going to be necessary for people to do what we call "info business", information business, when you start to transmit many different kinds of content and manipulate it across the Internet. A lot of the old ideas of copyright and intellectual property and so on break down. The papers we have seen from the EU so far do not really get to the heart of those issues, so finding the right kind of frameworks for dealing with intellectual property is important. If I create a new media document which has a little piece of this, a little sound clip of that, a bit of video from there, an image from here and seven words from there, where the copying function now is zero as opposed to having to cut it out, put it on a photocopier, paste it and so on, how do we deal with that legally? The third area was that we would just like to ensure a regulatory framework—my colleagues will have some insights into how to do it, I am sure—that will give low cost, higher band width pervasive access to this network. We feel that one of the things that is important for everybody to understand is that the running costs, the communication costs, of the use of these facilities are at least as important as the capital costs. If we talk about buying PCs to put in schools, maybe the real issue is the running costs of the communications that they have to have because this is about interaction. How do we really address getting low cost access at progressively higher rates? To the extent that we can do that in this country earlier than other places, then we could be a leader in exploiting the facilities. In terms of content, we picked two things: old content and new content. Old content says that what is going to happen over the next 20 years is nothing less than the digitisation of almost everything that anybody has ever written as a book, a play, a piece of music, a work of art or as a piece of scholarship and so on. Maybe in 20 years from now all of that will be available in digital form, a once for all kind of thing, some really major change in what is available for society. In terms of that old content, maybe the UK should be just getting on and doing some of that

Lord Flowers *contd.*]

rather than waiting for others to do it, rather than waiting for others to buy up the rights to the National Gallery or wherever. In terms of new content, we feel strongly—as we said in the report—that the interplay between creative media people and creative technology people ought to be strongly sponsored because out of that will come new kinds of media, new kinds of creative activity. We do not know what it is so we have to learn by doing. We have to experiment and find out how things are going. If we foster that early, then we could be a leader rather than a follower.

679. I warm to what you say but I cannot quite see what role the government has in that sort of thing.

(*Dr Taylor*) In the last example on content, it is difficult. We raise this again when we come to the next item about distributed information management. One of the things that we are beginning to get to grips with is that some of the ways of behaving in this environment are different than traditional academics or traditional industrialists or Link programmes or research councils maybe are quite used to dealing with. We do not quite know yet how to articulate the "get in there and learn by doing" kind of mode of exploring this, as opposed to his piece of academic research or his industrial link work which each of us can do.

(*Mr Ward*) I think one answer to Lord Flowers' question goes something like this: if an appropriate IPR framework is not in place, then the creators of the content will have no means of protecting the investment they make in creating this content. Again, IPR regulation or the development of an appropriate IPR framework so that content creators can realise their investment is probably as important—or even more important now—than, say, telecoms regulations.

680. But it has to be global?

(*Mr Ward*) Yes, it has to be global.

681. It has been put to us that the present regulatory structure, because it can only do things in the UK, is trying to treat the problem as if it was a British problem, failing to grapple with the fact that the information infrastructure is essentially a global phenomenon. Do you have any comments about that?

(*Mr Ward*) If we think in terms of telecoms, Oftel is obviously a UK body. It has UK jurisdiction but of course it does have input into the European discussions. These European discussions, as you probably know, are moving towards a European liberalisation in 1998 which will create in time a similar telecoms framework to the UK; but of course there are also global discussions. The WTO discussions on the liberalisation of telecommunication services have just broken down on the basis of certain problems with satellite communications. We would support the government in its participation in the European regulatory evolution and we would support the European Union in its role in global service liberalisation, because it is services in terms of telecoms that need to be liberalised. The equipment market is already wide open.

(*Dr Taylor*) I think our final recommendation in this area was a very vague one but it was to do with ensuring that government agencies, bodies and policies really do reflect this convergence of things that were previously very separate. Telecoms is not isolated any more. There are many other domains that are really getting involved very closely. The government needs to make sure that the right cross-couplings are in place inside itself so that it can be more enlightened in the way that it behaves externally. If we insist on talking about things in separate, watertight compartments, we will not really get to the heart of some of the new issues.

(*Professor O'Reilly*) I think there are two domains there. One is that the regulatory framework in the UK needs to evolve. That was said in one of the Foresight reports and that is clear. What we mean by "telecommunications", or what those of us in telecommunications mean by "telecommunications", is expanding to stamp across things that other people in the past have seen as part of their domain. Those things are converging. The other thing is that national boundaries do not mean anything any more. It is those two dimensions—that is, if you like, the boundaries as to what we mean by telecommunications, that are expanding, and the boundaries of the normal geographic domains of regulation—are irrelevant as well. There are two dimensions. What the UK government can do I think is to recognise that and sign up to it unequivocally, to recognise that that is the direction and therefore, if you like, to play a lead role in enabling us towards that which needs to be there for this to operate effectively. That is very vague but I think it would be very useful if one saw a real sign up to that.

Lord Craig of Radley

682. The Performing Rights Society in evidence say that they believe the correct copyright regime is in place to deal with the advent of an Information Superhighway. They go on to say: "This copyright regime must be complemented by an effective enforcement regime." Would you like to comment?

(*Mr Ward*) I think it is the problem of enforcement that Dr Taylor was actually referring to. Can we detect that something has been copied? Can we detect that something has been altered? Answers to those questions lie in one or other use of encryption technology so we are back where we started.

Lord Flowers

683. We should remember that we are only just now finding out that Beethoven pinched a lot of his important melodies from others at the time, but I think one can take it a bit far.

(*Dr Taylor*) There are two particular pieces on this. One is if you say, "What is the future of the personal computer?" a lot of people say that it is going to get smaller and cheaper and so on. What is really going to happen is that you are going to have a lot of them. They are going to disintegrate in just the way that each of us probably owns 50 electric motors without really understanding that we do and certainly without having gone out and bought one. In quite a

Lord Flowers *contd.*]

short time, the average individual is going to own quite a lot of computers built into things in various ways. One consequence of that is that the person is going to own an awful lot of electronically stored stuff. We have just brought out CD writable things. You will have an IT stack in your living room rather like the hi-fi stack in your living room. The new digital video standards will do the same kind of thing, so it is going to be possible for you to receive an enormous quantity of material into your personal information environment. The notion that somebody is going to come around and police you and watch whether you are copying or not, or what you are doing with it, is just crackers. There are not enough people on the planet, so some other means will have to be found. They will probably depend on encryption but they will also depend on a move from pay by use to subscription. You will take out a subscription to something and you will then have the right to do what you like with that material, subject to some pretty broad constraints. I do not think the copyright people have really faced up to that at the moment.

(*Professor O'Reilly*) I think the Beethoven example was a super example to hook onto because we have read that and he added enormous value in terms of doing it. One of the issues is how you actually apportion returns on the eventual thing to that which was original and that which has been transformed beyond recognition. That is going to happen a lot in our business.

Lord Flowers] My concern really is that the technology is capable of finding a given phrase—more rats than mice, said by a politician on some significant occasion in the House of Commons. Did he say it first? If people are really going to make a fuss about who said or did something first—it may be even invented, and it is a question of half a dozen words or so or the equivalent graphic quantity—one is just going to have an absolute absurdity for a system. It seems to me there has to be some sort of general understanding that only stuff above a certain level can be accused of having been pinched. Otherwise you cannot operate, it seems to me.

Baroness Hogg

684. You mentioned a moment ago the need to develop a distributive information management framework. What actions are needed to carry forward your recommendations about the ten year collaboration? What needs to be done to create this collaboration between industry and academia on that time frame?

(*Dr Taylor*) I alluded to this earlier on and I think we have not got much to say except that, at the moment, we are a little puzzled. We think it is probably because it requires somewhat of a different style of activity than maybe some of the mechanisms that we have tried are used to. At the moment, it probably behoves us in the Community to go away and try and understand more clearly the kind of learning by doing on a fairly large scale. How would you, for example, promote a serious centre of excellence in the UK in some dimension of content management and so on, actually doing it on the Internet for real, the way they do their research? How do you get involved in the running costs of that? It is a little bit like a smoke filled room. You do not know what is going on in the smoke filled room unless you are in there. You do not really know what is going on inside the Internet unless you are actually in there doing. Learning by doing is not quite the style of a lot of the collaborative research that we are used to funding, so we have to persuade researchers, we have to persuade companies, we have to persuade communities to do something a little bit different and for real.

(*Professor O'Reilly*) Probably as the token academic, despite the titles, I think some of this does not fit too well with our existing ideas of what is a research project funded by the Research Council. I think to some extent we are trying to promote this idea. Some of this really came through the Foresight process. You can only get to it by doing it and that is rather different to writing a normal research proposal, things that fit within the EC remits. It does require this sort of collaboration. We have identified it as something that needs to happen for which the existing frameworks do not seem to operate effectively at the moment.

(*Dr Taylor*) It really takes us to the next question also because these *de facto* standards are moving so fast because of this style of learning by doing, putting in place things which suddenly everybody can have. It is not quite in the train of the normal mechanisms that people have.

Chairman

685. Perhaps you can move on to that question. Are we going to avoid another Betamax/VHS debacle?

(*Dr Taylor*) I think things are very different. There are one or two areas like digital video disks where the standards bodies and the *de factos* are fighting it out the other way, but the things I would direct your attention to much more are things like the computer systems policy project in the US that we mentioned; this whole network of discussions about security encryption, trusted third parties and so on, the intellectual property debate, the plethora of activity on new payment protocols, electronic commerce standards and so on and indeed the Worldwide Web Consortium itself. All of those are very actively setting major standards for how things are going to be done. Government needs to make sure that the minimalist *de jure* framework is in place and agreed internationally that will let this other activity produce a result that is not a blind alley, is not a sort of Internet version of Betamax that is not going anywhere, because it will not work internationally. These things are going very much faster than classic standards people are used to. They are very much not just UK and Europe. Therefore, we ought to be thinking about how we can really make an input to things that are happening in the US, things that are going to happen in Asia Pacific and so on, maybe by leveraging companies and organisations that are present in Europe, making sure that we get the European views in by whatever ways we can. They are not just in those silos, the telecom silo, the

Chairman *contd.*]

copyright silo, the software silo. These things are all talking across the domain and we need to get the right kind of representation if we want to be influential. We would very much like to see UK government, in some sense, paying more attention to getting really good people from the UK involved in the international *de facto* and *de jure* fora and maybe also having a policy of attracting one or two of the key things to be present in the UK. The Worldwide Web Consortium is a very good example. The Worldwide Web was invented in Geneva. The EU had the chance to host the Worldwide Web Consortium when it was set up in Geneva but dropped the ball for various reasons, so it is now in MIT in Massachusetts. I am sending somebody from my organisation to be a member of that in Massachusetts rather than in Geneva. The second time around, the Worldwide Web Consortium in Europe is being hosted by INRIA in France. There was a major conference there in Paris last weekend where all the people came together. I would like to see the UK having a policy that one or two of these key things really ought to be here and we really ought to do something to make sure that they do come here, to maintain our visibility and our credibility in some of these fora.

686. At a rather low level in all that, but it does affect the education world let us say, one finds competition still between the IBM based PC, the Mackintosh and Acorn, all of which have different education software that has been written for them. How does one address that sort of difficulty?

(*Mr Ward*) Just as a starter, speaking from my experience as a school governor, we have policy to expand IT in the school, obviously like everybody else. What we have plumped for, for the time being, is Acorn computers that can emulate IBM PCs so at least we can run the IBM compatible, the Windows compatible, CDs on it.

(*Dr Taylor*) But again we are seeing the emergence of new levels of standard software like Netscape and other things which are above operating systems and may supplant them. It is again very important that people who are involved in, for example, the education market place are in there learning by doing, making sure they are solving tomorrow's problems and not yesterday's.

Lord Craig of Radley

687. The impact of the information society on employment, particularly skilled workers—I had my withers wrung with your opening remarks on the collapse of the CD ROM distribution market. I was encouraged that perhaps my bespoke suit might be delivered by somebody to my home address, but more seriously, apart from the distribution side of life, what are your views about the impact on employment as a result of the information society?

(*Dr Taylor*) We had two things we really wanted to begin with. First of all, unemployment itself. We think that there are two quite opposing factors at work. One that will increase employment and the other that will reduce it. I do not think any of us knows which way the overall equation is going to come out. On the increase side, it is a wonderful opportunity for business in the UK, small, medium and large, to reach many new market places internationally, to reach new kinds of consumers, to serve enterprises in other countries and so on, so it is an excellent opportunity for knowledge workers, for brain power, really just to get on with it. Access like that is going to be very important, so the UK could become one of the best places to have brain power businesses. That key question of why do you not set up this particular piece of value adding business activity in the UK rather than anywhere else is going to be a central question for our Foresight Panel. I think it is a central question for the UK economy and for UK politics. Why would you do it here? On the down side, exactly the opposite. It is a wonderful way for businesses in other countries to come and access domestic markets here and supply them. It is a wonderful way for businesses here to out-source functions to overseas suppliers. It is a great way to export jobs. Since this is going to happen anyway—this technology is going to happen whether we in the UK like it or not—our view very strongly is that we ought to be a leader; we ought to be a leader in really understanding how to win with this technology and also have a key leadership role in developing some of it. We ought to be famous for a few pieces of innovation in the technology. The UK ought to be the place that does that particular part of it. It is not going to go away and if we really do not master it then we fear that the down side will win over the up side. The second point we wanted to make really quite strongly is about skills. Information technology is going to need information technicians, large numbers of information technicians, the equivalent of crafts people, and that is not the same as programmers or people with keyboard skills. We really feel it is very important that we start to understand societally what it means to be an information technician, what kinds of training, experience and apprenticeship are needed and so on. It is not about writing programmes. The other part of that is if this technology really is going to be pervasive in society then most of our citizens will need to be literate in those sorts of skills. It is not just for their professional lives or their work lives but most people will need to be able to feel quite comfortable with this. So education and awareness for the mass of the population is going to be important. Just as we move from typing to word processing we are going to move to multi-media authoring or whatever it may be and that will be important to typists, it will be important also for academics and authors and scholars and all kinds of people who will have to learn to write new kinds of documents in new kinds of ways. So awareness and fluency and so on are very important at a whole set of levels. To come back to a point that was made earlier, we feel very strongly also that this technology is going to become quite central to the way education and training itself is carried out. If you think about doing co-operative GCSE projects between different schools or between different countries and so on, if you think about how to submit homework electronically and have it assessed, if you think about not only tele-cottages for people to work remotely but maybe community places where kids can do their homework using electronic facilities within a

Lord Craig of Radley *contd.*]

community instead of immediately in every individual house, we think things like tutorials by remote experts are going to be far more important than things like tele-surgery which is getting all the media attention at the moment. We hear about people doing surgery remotely on your brain, that may or may not be an exciting thing to have happen to you but the ability for somebody to take part in a mediated seminar of some kind with an expert who does not happen to be at your school is going to be hugely important. Finally the whole business of assessment, how do we assess people's progress, could be radically changed by the sort of technology that is used. Again it comes back to running costs. It is not just buying the PC, it is how do you get the software, how do you get the skills, how do you pay for the communications but we think that again learning by doing right back down to the early parts of training, apprenticeship, schooling is going to be very, very important and learning by doing is going to be a hard cultural thing for people to get their heads around immediately because until you have tried it you do not really trust it.

Lord Flowers

688. Could I just ask a quick supplementary. You have talked about information technicians, and I am sure you are right that there have to be some, but all the rest of what you said was an illustration of what I had always thought was the case, that every man is his own technician. Do we not all have to learn how to use information technology and not rely on a typist or whatever who fashions the technicians to do it for us?

(*Dr Taylor*) Those were the two points I was trying to make. On the one hand we do need a whole generation of people, it is rather like plumbers or kitchen fitters who can bridge the gap from buying a PC to solving a business problem in your company, who can put all the pieces together, get them connected to the right networks, get the right pieces of software and make them all work, all without writing a single line code. When you want a kitchen installed in your house you go and choose a particular branded range but then you get somebody to put it all together for you and get it connected to you so that is the technician but then you need to be literate in how to use word processing skills or whatever it is you need in your line of business.

Lord Flowers] I put it together myself, I thought that was what one was supposed to do in this day and age.

Baroness Hogg

689. On your kitchen analysis we have all to be able to cook but we do not all have to be able to instal kitchens.

(*Dr Taylor*) Exactly so. One of the big gaps people are facing, talking about awareness to small businesses of how to use this technology right now, is that there is a rather short supply of the people who can bridge that gap from buying a PC to producing a working business solution.

(*Professor O'Reilly*) Where the kitchen analogy breaks down is putting it together does not necessarily mean handling physical things, it is more than that and it can be done remotely. That links back to the earlier point about making the United Kingdom one of the places that people come to for those skills. The thing about roads running both ways applies to these sorts of highways as well.

Chairman

690. I am afraid as usual time has overtaken us. Thank you very much indeed, Dr Taylor and colleagues. Would you like to say anything, briefly, as a final statement?

(*Mr Ward*) Again I would like to repeat and re-emphasise what Dr Taylor and the others have said. If we are going to take advantage of the new markets that are going to be opened up using this technology then the United Kingdom has to be a good place for developing these products, firstly. Secondly, if the products are not developed in the United Kingdom but are developed somewhere else, are United Kingdom people going to be involved in the distributive sort of way in developing these new products? Both of these require a level of skill and the ability to manipulate the technology which we have not got. If you want a single thing that will enable this from the point of view of the United Kingdom, and which Government can do something about, that is training.

(*Dr Taylor*) I think our absolute bottom line is we believe this technology is profoundly important. It is important in many different ways. Sixty years ago people might have said the phone was not terribly important because people would spend most of their time chattering on it, chattering is very important in society. Many other kinds of uses of this technology are very important in society. We think it is going to be quite disruptive, quite profound and we ought to be master of it and a leader in its exploitation not a rather unwilling laggard who just has it done to us.

Chairman] Thank you.

Memorandum by the Institute of Physics

INTRODUCTION

1.1 The Institute of Physics is the learned society and professional body for physicists in the United Kingdom and Republic of Ireland. Its membership of over 20,000 comprises physicists working in industry, academe and the public sector. The Institute's objective is "to promote the advancement and dissemination of a knowledge of and education in the science of physics, pure and applied".

1.2 The Information Superhighway is physics based. Its two best known elements, Internet and the World Wide Web, were originally developed by research physicists to further their work, for advanced defence research in the case of the Internet and for particle physics in the case of WWW. It is, therefore, natural for the Institute to have a great interest in and commitment to the use and development of the Superhighway. Firstly, because many of our members are deeply involved professionally and, secondly, because the Institute sees in the Superhighway an important instrument for the fulfilment of its objective.

1.3 In January 1996, the Institute of Physics became the first publisher in the world to offer all of its learned journals on-line. Making the journals available on the World Wide Web ensures access to cutting edge research faster than ever before and allows users the flexibility to work where, when and how they want, 24 hours a day, seven days a week. Furthermore, the electronic journal is included in the price of an institutional subscription for the paper version; thus existing customers pay no more and all faculty members, students or employees can benefit from this free-at-the-point-of-use service.

What users receive is a carefully designed service with logical navigation links that enables them to view Tables of Contents (this is available to all users, irrespective of whether their institution subscribes or not), a demonstration of the service (again open to all), and full articles. Customers can search and browse, and will shortly be able to set their own profiles and make use of other storage tools which will aid their work.

1.4 The Institute, therefore, not only believes in the great importance of the Superhighway but is also active in its development; it has a positive view of its future. However, it is probably most helpful to the Sub-Committee if the Institute's evidence concentrates on issues that cause it concern.

1.5 An overriding concern is the speed of developments in the United States in comparison with those elsewhere. The UK has an enviable reputation in the Information Technology area, and many initiatives were of British origin. But we are being left behind. For an understanding of the situation in the United States, we trust that the Sub-Committee has had the opportunity to study the recent report of the US National Research Council, *Realising the Information Future.*

SCIENTIFIC RESEARCH

2.1 The research community has a deep commitment to the use of the Information Superhighway; it is and will continue to be an important element in any successful national research programme. But it is also important that researchers are allowed to develop its potential further, unlimited by commercial requirements.

2.2 The Superhighway is now being increasingly used by society at large and as a consequence, the very scientists who were responsible for its initiation and growth are no longer in the forefront of the exploitation of developments. Broadband communication facilities are being established in the USA, Japan and Europe by large multi-media corporations, a process which will be accelerated within the EU by the deregulation of telecommunications in 1997. Few of those involved have any great interest in academic use of the networks. The Institute considers it important that measures be taken to protect the interests of the research community in future development of the Superhighway.

A recent ICSU-UNESCO Conference unanimously endorsed the view that adequate and reasonably priced network access is essential for scientific research and scientific education. National authorities should ensure that appropriate infrastructure be established for this purpose and that scientific data traffic receive appropriate priority. The Institute trusts that the Sub-Committee can support this statement.

2.3 In practice, the most serious problem for UK scientists is in connection with international traffic, where the facilities are completely inadequate for the international collaboration that science requires. From a good starting position, the UK situation as far as connection is concerned is now worse than those in many other countries. The aim must be that a scientist can communicate as easily with a colleague abroad as one in a different building of the same research institute. Such a requirement is being addressed in the US. The Institute asks the Sub-Committee to highlight this problem so as to ensure that UK researchers are not disadvantaged with respect to others.

2.4 The Institute is concerned about future financial arrangements with the telecommunications providers. It is essential that they do not charge academic users on the basis of "bytes" used or seconds connected, which may be natural for the purchase of commercial information. It is the very nature of research and teaching that the time required or the number of bytes needed are uncertain. The Sub-Committee is asked to propose that any charge for academic use should be based on the bandwidth provided.

2.5 Somewhat separate from explicit use of the Superhighway, but closely related, is the establishment and transmission of large sets of research data. Establishing, maintaining and accessing such information can be expensive. The Sub-Committee is asked to agree that such costs should be explicitly recognised as an essential element in the funding of research.

The Publication of Research—The Electronic Journal

3.1 Many active scientists, particularly the young, believe that electronic publication will soon fully replace the printed journal. Whatever the future holds, there is clearly bound to be an increase in the provision of material in electronic form. It is a debatable point whether this also signals a substantial decline in, or demise of, the printed product.

3.2 In theoretical particle physics, the main method for reporting scientific progress is now overwhelmingly by the 'electronic preprint' distributed electronically by Internet, thereby bypassing traditional publishing. Partially because of the success of such schemes, several organisations have announced plans for electronic journals with no printed version. Some scientists argue that such journals will be inexpensive. However, some 50-80 per cent of the costs of publishing a printed journal are incurred before a copy is printed. This is largely due to the refereeing process which is necessary to ensure a high quality product. In a survey carried out by the Institute of research physicists the respondents overwhelmingly stated that they wanted a conventional peer-reviewing system, whether the delivery medium was paper or electronic.

3.3 If poor quality electronic products are not to damage scientific publishing and, therefore, science itself, it is necessary that bodies such as the Institute ensure that standards of research publications are maintained. The Institute is determined to maintain the highest refereeing standards in its journals and it would also urge similar standards on other publishers.

3.4 The Institute took the bold step of including the electronic versions of its journals within the price of the paper product. This policy was aimed to make information more widely available to physicists—in line with the Institute's overall objective—without draining money from academic libraries at a time when they are already under financial pressures. The move has proved popular with libraries throughout the world and seems to have led to higher readership of research articles. Electronic journals, in the Institute's experience, allow for much greater usage in terms of individuals accessing the service, and much higher readership of articles.

3.5 A printed book or journal attracts zero rate VAT. That exact same content delivered on-line or by some other electronic method, attracts full rate VAT. This is obviously an anomaly and one which the Government should address. The Institute believes that on-line publications which are based on paper equivalents should also be zero rated and the Sub-Committee is asked to support this view.

3.6 An issue which concerns the Institute is the archiving of electronic publications. Paper can be archived for centuries and still be read but the situation is very different for electronic digital information. Hardware on which digital information is to be recorded and accessed has a typical life of 10 years. An archive, therefore, requires active re-recording. Moreover, protocols for coding information, its classification and storing constantly change. The maintenance of an archive will require expensive human involvement to ensure that, by continual copying and updating of protocols, it can still be accessed.

A commercial publisher might be willing, and even anxious, to maintain an archive as long as it has commercial value as a database. The rapid changes of ownership of publishing houses in the last few years make their assets particularly vulnerable. If research and scholarship are not to become ephemeral, active archives will probably have to be maintained by the learned societies, such as the Institute, perhaps in association with national legal deposit copyright libraries—but the operation will not be cheap and the costs will somehow have to be recovered.

3.7 That funding for university libraries has decreased in real terms is well documented. The Institute is concerned that many universities no longer are able to purchase sufficient books and journals—in paper or electronic form—to provide a viable service to its research scientists. The Sub-Committee is urged to press the case for adequate library funding to ensure that scholarship and research can thrive.

Physics Education in the Schools

4.1 Physics is perceived by many in schools and colleges as a difficult subject and the Institute is concerned by the relative decline in the number of students opting to study the subject post-16. It is also concerned that, at a time of shortage of good quality teachers of physics, the number of those applying to train for the profession is declining.

The development of the Superhighway brings new opportunities to improve the situation and its potential importance for school and college education cannot be exaggerated. CD-ROM multi-media facilities are already transforming learning methods, yet these are limited compared with the real-time interactive possibilities being opened up by WWW and its likely developments.

4.2 The Institute believes that the highest priority must be given to ensuring high speed access to the Superhighway in every primary and secondary school and in all colleges in the country. More active involvement in their own learning is likely to increase students' interest in physics and other subjects and students' use of all multi-media, including the WWW, will lead to their developing the skills of autonomous learners, skills which are of paramount importance in our modern world. Also, the Institute, with many members knowledgeable in the application of the Superhighway is in a strong position to help with the introduction of this new technology in schools.

4.3 The Institute has for many years been active in the area of curriculum development for physics in schools and colleges. It is currently engaged in a pilot project which will lead to the establishment of a major curriculum initiative, one aim of which will be to give students in schools and colleges access to, and some understanding of, advances at the frontiers of research and the most modern applications of physics. The resources of the WWW will be of key importance to students and teachers in this respect, not least in ensuring that any curriculum enrichment of this nature is continually updated.

4.4 Access to the Superhighway, coupled with essential training, will have double benefit for teachers. It will lead to an enrichment of the teaching and learning experiences they can offer their students and the WWW will play an important role in their own Continuing Professional and Personal Development.

THE IMPACT ON SMALL AND MEDIUM SIZED COMPANIES

5.1 Nearly all the reports of the Technology Foresight Panels stressed the great importance of the Information Superhighway. But the Institute has recognised that there is often a serious problem with some, though of course not with all, small and medium sized companies, a problem which is not technical or even financial, but one of perception and training. Many such companies simply do not realise what networking can do for them.

5.2 The Institute has therefore launched a £23,000 project, jointly funded by the DTI, to disseminate the recommendations from the Technology Foresight Programme concentrating on small and medium companies. It has published a well-received summary of the Foresight reports aimed at such technology-based companies.

5.3 The Institute has established an SME Club offering a range of services specifically tailored to the needs of small and medium sized technology-based enterprises irrespective of market sector. In support of its SME Club, the Institute has submitted a proposal to the Department for Trade and Industry's Information Society Initiative for a programme to encourage use of the Information Superhighway for networking and trade.

5.4 The Institute plans to foster a "nephew-uncle" relationship between such technology-based companies and the two dozen or so large companies that are affiliated to the Institute on a corporate basis.

5.5 The Institute is planning to continue its work in this area. Again, the knowledge of the use and application of the Superhighway which resides in membership of the Institute can be used to the benefit of industry.

Examination of witnesses

PROFESSOR IAN BUTTERWORTH FRS, Vice President for Publications, DR ALUN JONES, Chief Executive and MRS ANNE DIXON, Business Development Manager, Institute of Physics, called in and examined.

Chairman

691. Professor Butterworth, Dr Jones and Mrs Dixon, thank you very much for coming. Professor Butterworth, perhaps you would like to introduce yourself and your colleagues and then make any preliminary statement that you think fit.

(*Professor Butterworth*) My Lord Chairman, may I introduce on my right Dr Alun Jones who is the Chief Executive of the Institute and on my left Mrs Anne Dixon who is our Business Development Manager. I am a Vice President of the Institute with particular responsibility for publications. I would like indeed to introduce some of the issues that the Institute wants to raise in its evidence. The Institute is the learned society and professional body for physicists with over 22,000 members and it is natural for the Institute to have a great interest in and commitment to the Information Superhighway. Many of our members are deeply involved professionally, and we see it as an important instrument for the fulfilment of the Institute's objectives. We have a very positive attitude to its use and future, but it seemed to us that it would be most useful to your Lordships, not to add to the evidence which you must have had on the opportunities which it brings, but rather to concentrate on issues that concern us. We realise that your Lordships are particularly interested in our evidence on electronic publishing, and indeed the Institute is one of the most active publishers in that area, and we are certainly very willing to concentrate on electronic publishing. But the Institute is anxious to bring forward evidence in four areas: scientific research, where perhaps we have some of our greatest concerns; electronic publishing; physics education in schools; and the impact on small and medium technology-based companies. We have an overriding concern at the speed of developments in the US in comparison with elsewhere, and particularly in the United Kingdom, and we could cite some examples. If my Lord Chairman would agree, we would like to start with some of the issues in connection with scientific research, invite your questions and then go on to the other areas. There are two aspects in connection with research and the Superhighway. There is the research which will lead to improved facilities and opportunities within the Superhighway itself, just in the same way that it was the past activities of research physicists that created major elements of the highway. But there is also the fact that its use is a growing important tool within any research area. As

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a recent ICSU-UNESCO Conference concluded, adequate and reasonably priced network access is essential for scientific research. We are concerned that the international telecommunications industry and the large multi-media corporations that are dominating the Superhighway do not have a very great interest in its academic use. There must be regulatory measures to protect the interests of the research community. Let me give an example. It is from my own area of particle physics, since all experiments involve international collaboration and its community automatically becomes aware of the facilities provided in other countries in comparison with our own. As of today, the Internet service available to British researchers has steadily worsened since early 1995. One should distinguish the situations between Transatlantic and European traffic, but basically the consequences are the same. It is a well known fact to us that America disappears in the afternoon! In the case of Europe we are, I believe, the only European country that connects to our main laboratory at CERN only via Europa-net. Our colleagues abroad have taken a much more pragmatic view using leased lines to supplement Europa-net, with the result that they get a much better service. I stress that this is not a criticism of UKERNA, with which the particle physics community has good relations. It is a consequence of the fact that British academic traffic has insufficient protected bandwidth to support our national research programme. For our publishing operations, the Institute uses commercial Internet providers rather than JANET, the academic network, and so we can readily compare the two services. It is our view that the academic community is getting a poorer service than commercial users. The Institute asks your Lordships to highlight these problems so as to ensure that United Kingdom researchers are not disadvantaged with respect to others.

692. Could we just explore that a little bit further. Other people say to us that SuperJANET in particular leads the world in terms of high bandwidth network which is available to a larger number of United Kingdom academic institutions though not equally accessible by any means to industry and schools and so on. Are you mainly talking about the problems of international connections between SuperJANET and Europa-net?

(*Professor Butterworth*) Yes. Generally speaking communication within the United Kingdom is very successful so I am only talking about international traffic as the main problem.

Lord Flowers

693. The scientific community is on the whole satisfied with SuperJANET for national communications?

(*Professor Butterworth*) I believe so.

694. Through what channels can you try to influence the international connections?

(*Professor Butterworth*) One of the natural problems of networking is of course that it is often hard to determine where decisions are being made. In the case of Europa-net it is by no means obvious that any individual agency within the system holds itself responsible for making sure the messages go from A to B successfully and that clearly is a problem. I can only assume that the right approach is to improve the power, as it were, of bodies such as UKERNA or the Joint Information Services Committee to negotiate with the other European countries.

Chairman

695. Thank you. Would you like to continue or shall we go on to our questioning?

(*Professor Butterworth*) We can indeed move on to electronic publishing.

696. Right.

(*Professor Butterworth*) In January the Institute became the first publisher in the world to offer all its 31 learned journals on-line, and the electronic version is included in the price of an institutional subscription to the printed version. Anyone in that institution can access the electronic version on their local terminal. Most of our sales are abroad, and we last week finally signed with the United Kingdom Higher Education Funding Councils a licensing agreement which allows anyone in any British university electronic access to our journals regardless of whether that particular university has bought the printed version. Our purpose, of course, is to make information more widely available to physicists as a part of our basic remit. The Institute is a major publisher of journals and books, and the Institute's income depends overwhelmingly on our publications. However, the physics community is moving quickly to electronic publishing. We hope that by keeping in the vanguard of developments and by enhancing the quality and facilities associated with our journals we will keep them attractive both to readers and to authors. My Lord Chairman, my colleague, Anne Dixon, will give more details of our future plans and of some particular concerns that we have.

(*Mrs Dixon*) My Lord Chairman, it is too early for us to fully know the consequences of our policy, but there are two straws in the wind that encourage us. We have run a pilot experiment with our Classic and Quantum Gravity Journal which I believe was the first to have a complete electronic version. It has been welcomed and the experience suggests that an electronic version can stem or halt a decline in institutional sales. Secondly, we ran a very large survey of research physicists worldwide and they were very clear that they wanted properly refereed and edited journals whatever medium is used for publication, and despite the growing use of less formal communications through electronic preprints and bulletin boards. There are some particular concerns that we have. Firstly, that printed books and journals attract zero-rate VAT, but the exact same content offered on-line attracts full-rate VAT. That is an anomaly which we hope the government will address as it discourages the use of modern techniques. Secondly, we are concerned that the decreased funding of libraries in real terms is preventing universities from buying sufficient books or journals whether in paper or electronic versions. That problem cannot be significantly eased by turning to purely electronic publication. Most of the

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costs of a publisher are in the refereeing and editorial operation. "Going electronic", as they say, does bring new and exciting opportunities but should not be seen as a quick fix for financial problems, if scientific standards are to be maintained. For example, one of our concerns is that of maintaining an electronic archive, which is not likely to be cheap, and the costs of which will somehow have to be recovered. Thank you, my Lord Chairman.

Lord Flowers

697. Could I ask you a number of questions on what you have said. Firstly, why did you decide to publish electronically in January when there are so many problems that you have described which are still unresolved?

(*Mrs Dixon*) Firstly our objective as an Institute is to disseminate information in physics. We knew that possibly of all the sciences, physicists are experienced and heavy Internet users. Our research did indicate that the demand existed and that in the main they had the equipment which enabled them to use this. We chose all of our journals because our research indicated that what they wanted was a breadth of coverage within the given subjects. Finally, of course, our experience in our trial period had indicated we might be able to stem or halt the attrition of institutional sales with the advent of electronic journals.

698. Are other scientific disciplines or engineering professions, medical professions following?

(*Mrs Dixon*) They are following, some are at a similar level and some are slightly further behind.

699. Could I ask you what advantage you intend to take of the electronic format? Are you considering publishing exclusively electronically, no paper copy at all and are you thinking of such fancy tricks as making reference to hypertext and so on?

(*Mrs Dixon*) Absolutely, yes we are. Currently our electronic journals offer on-line services such as searching, alerting, E-Mail links and usage reporting but the future holds some quite exciting opportunities for us. We are going to launch the next version of electronic journals which we will call version 1.1 in June. That will include some improved navigation methods, individual profiling so that the user can have a much clearer profile and obtain the information more quickly, what we call virtual filing cabinets, possibly not to replace the great banks of filing cabinets in the rest of the system, links to errata, corrigenda and addenda and we are hoping to have all this up very shortly. The longer term plans do indeed include what we call Intercite, which is the hypertext linking of references. We are embarking now on quite serious discussions with fellow organisations such as the American Institute of Physics and the American Physical Society.

700. Finally, how does what you are doing in the United Kingdom compare with what is going on in other countries amongst learned societies?

(*Mrs Dixon*) In the world of physics it is quite interesting that we have taken a very defined route, electronic journals, some of our other partners societies and fellow societies in other territories have chosen to address other aspects of electronic publishing. So for instance one may well be concentrating on archiving issues, another may be concentrating on the creation of databases and we do all seem to be taking quite independent routes.

Chairman

701. Many people would argue that learned societies over recent years have profited enormously from their publishing programmes and those programmes have become the mainstays of their financial success but the value the learned societies add to publishing and all of this is essentially tied up with the refereeing, editing procedures and with the archiving of material afterwards and then there are some ancillary things like the provision of abstracting services and so on. All of these seem to a degree to be under threat as you move towards electronic publication. Are you actively explaining not only to your membership, because the pages of your journals are not only restricted to your membership but to your clients in general, what value you will be adding to electronic publication that will make it worthwhile for them to continue to pay you money for it?

(*Mrs Dixon*) In terms of the membership question perhaps Dr Jones would like to answer that.

(*Dr Jones*) Yes, my Lord Chairman. It is true that as an Institute we have depended and still do depend to a great degree on the income we receive from our publishing operations. Indeed, if we did not have an income from publishing, many of our programmes would have to be curtailed. But I think it is important to realise and it is realised within the physics community in the United Kingdom, that the money is ploughed back into physics to support physics in schools, to support physics in universities and to support standards in degrees. I have to say that we have some problems convincing people in other parts of the world that this is so, but they do accept that we are a not-for-profit publisher. If I might say something about the second part of your question, as Anne Dixon mentioned, and is mentioned in our evidence to you, some 50 to 80 per cent of the costs of producing a journal lie in the refereeing and the quality assurance procedures. Indeed, we are doing our best to try and convince our readers, physicists worldwide, that in fact the supply of electronic journals on-line cannot be free. We must somehow cover the costs involved.

(*Mrs Dixon*) I would just add we have obviously consulted widely before embarking on such a bold step and we very much had emphatic feedback that this was what our users wanted and our members wanted. Indeed this has been very much part of our way of moving forward.

Chairman] There are some areas, particularly in physics, where less formal publishing is growing a pace and Lady Hogg would like to return to the earlier question.

Baroness Hogg

702. I am not sure we have not leapt to the issue of new services. There was one matter I wanted to pick up on from what you said about publications. To what extent does the ease of copying of electronically published material create new problems for you in sustaining the subscription base to any of your learned journals?

(*Mrs Dixon*) Our remit is to disseminate information and the way in which we control it is limited to a certain degree in that we control it using a system of passwords and IP addresses. Our security system, if you like, is really designed to enclose a campus or institution so within that institution we are not terribly concerned about copying, outside is a separate issue but within the Institution we would like a great deal more usage and early indications are that we are having that.

703. One institution one subscription becomes the pattern.

(*Mrs Dixon*) Absolutely.

704. Once those institutions themselves create something between an Internet and an intranet how can you control that?

(*Mrs Dixon*) We work very closely with the most advanced institutions who are indeed trying to set up various types of electronic libraries to try to reach a balance between the two so that they are able to provide the best service for their users and we feel comfortable that the integrity of our works are held intact. Thus far it seems to work quite well.

Lord Flowers

705. In science for a long time we have sent pre-prints round to all our pals. Now if you put a pre-print on the Internet you are sending it to everybody so you are publishing it yourself. Why should anybody bother to publish through the Institute of Physics or any other learned journal when they can publish it themselves and it can be known without any rigmarole of any kind?

(*Professor Butterworth*) I should like to deal with this one since the area which is most active in pre-prints is indeed particle physics activity. There is a very impressive operation, which I am sure your Lordships know about, which is the Ginsparg system which runs out of Los Alamos. That pre-print system is essentially indeed replacing printed versions of the pre-prints. It is very successful. As the informal form of communication it is predominately in the area of theoretical particle physics rather than experimental particle physics. The moment one moves away from pure theory, those that are doing experiments, which are expensive and which they have to justify back to their funding authorities, require that their papers be properly refereed and appear in some respectable way which they can then bring back on as proof, if you like, that they have been doing a valid piece of research. Within the case of experimental particle physics, despite the existence of the Ginsparg pre-print system, to a first approximation, very few experimentalists send their pre-prints into the Ginsparg system. If they do, they do it at the same time that they are sending it to a proper respectable publisher. Therefore I share the view, which was indeed so strongly felt by physicists in our own survey, that whatever is being done about informal communication—which is very, very useful of course for the work, everybody loves to see that happening—that one wants at the end of the day to have a "reference paper" in a successful, well published journal. Whether that will be done eventually purely electronically I am not sure.

Baroness Hogg

706. You touched on experimentation with other services but I wonder if you would like to say a little more about that going through beyond where you are now to what you might be doing in five years' time?

(*Mrs Dixon*) I would not like to say what we will be doing in five years' time, this is a fast moving environment. I can tell you what we will be doing in the short-term certainly. We are aiding communications by creating an E-Mail directory of physicists and people in science which is actually going to go live very shortly, possibly next Tuesday, which is called PEERS. The other area of focus is electronic author services, really making lives easier for the authors allowing them to work electronically with us almost in total. The third area which we are exploring is subject based electronic fora so that a really very precise subject area can have its own electronic fora where discussions and joint activity can occur.

707. When you say that communications between yourself and authors could take place electronically do you mean at present even though you are publishing electronically hard copy is somehow passing between the authors and yourself?

(*Mrs Dixon*) A certain percentage of the total is still in hard copy, for whatever reason it may be, the author's preference to work in that way, but we are trying to move to a situation where that becomes 100 per cent.

Chairman

708. To pursue that a little further, is that anything to do with the confidentiality issue? Do you seek referee's opinions by electronic mail? Are you happy about that?

(*Mrs Dixon*) Yes, we do at times but we also still work with paper to a great extent. Professor Butterworth knows a great deal more than I do about the refereeing procedure.

(*Professor Butterworth*) I am not aware of any real concerns yet about the use of E-Mail for refereeing purposes, indeed we are moving towards using it fully. There is no concern that I have heard within the community that people will listen to what the referee is doing. We have certainly not decided that we want to go down the route of encryption or anything like that but obviously we could do that if we have to. I think we are trusting the community.

709. I am glad to hear that but one can imagine people being concerned about the identities of referees being revealed to authors, perhaps you already do that to some extent, and critical opinions being widely disseminated?

(*Professor Butterworth*) I do not think any of this very much changes from doing things by the present

Chairman *contd.*]

methods. Quite often our referees are almost willing to talk with the author.

(*Mrs Dixon*) I would add on the subject of encryption that we will shortly have the ability to handle encrypted messages and if we felt that there was a demand in the community, certainly for confidentiality with some types of work, then of course it would be very easy to implement. It certainly has not been a concern thus far.

Lord Craig of Radley

710. Could we turn to the problems of archival availability of purely electronic journals and publications. You do suggest in your written evidence that archives will have to be maintained possibly by learned societies. Do you see this becoming potentially expensive and, if so, who pays?

(*Mrs Dixon*) This is very much a concern. There are no clear lines of responsibility at the moment as to who should hold the electronic archive. We have made a commitment to retain an electronic archive for our own publications but, of course, we could not be at all sure that all publishers will act in that way and in societies this is certainly a concern and there are very considerable costs involved with creating an electronic archive.

711. And maintaining it over a period of time?

(*Mrs Dixon*) Absolutely.

712. But you do not see a solution at this stage although you can identify the problem?

(*Mrs Dixon*) Sadly not, no.

Chairman

713. The deposit libraries, the British Museum and so on, seem to be quite keen on the rules being extended to the deposition of electronic material. What would your view be on that?

(*Mrs Dixon*) It is a very interesting idea and something that we would like to explore further. In countries such as this it could work quite well, unfortunately, particularly in our disciplines, it is such an international activity that we could not be assured that deposit libraries and institutions in other territories would take a similar stance. That is certainly something that we would like to explore further.

Lord Flowers

714. Could I just go back to research for a moment. Professor Butterworth talked about the use of the Superhighway in particle physics and it is very understandable, but of course there are other sciences that chuck huge amounts of data around international groups, space science and astronomy and so on, and I can imagine you could say similar things about them. I am trying to get at how wide the demand is for the use of a Superhighway by research scientists around the globe quite apart from the ones we have talked about, the big sciences?

(*Professor Butterworth*) If I can try and separate it into several areas. If we look at atomic physics, for example, clearly there is a much greater use of super computer, modelling of atoms, molecules, and that usually implies that you have to have an ability to run a programme at a distant super computer site and that means you need a fairly good networking system. I think in virtually all areas of physics there is a very fast growing interest in the use of very good Internet connections in order to move the data from one super computer to another and increasingly many experiments—this has for example been because of EC funding—are now international and you have to be able to communicate with your colleagues abroad. I now observe that in virtually all areas of physics there is a very good interest in the use of high bandwidth, broad bandwidth communications.

Lord Flowers] Thank you.

Chairman

715. Going back, continuing that point, there are molecular biology, human genome projects and things like that which depend on the rate of communication between groups internationally. In your view it would be the Joint Information Steering Committee or UKERNA's responsibility, would it, to extend SuperJANET to be responsible for international connections between the USA and Europe particularly?

(*Professor Butterworth*) I would assume, given the present arrangement with UKERNA and that the Joint Information Systems Committee runs the network in that sense, they would still be the responsible agent and I presume that the research councils will actually be the ones who will have to fund the scientific research aspect by means of a contract which is essentially what happens now and I guess that contract has to be maintained.

716. Either way that depends on Government money?

(*Professor Butterworth*) Yes, of course. Whether we are talking about UKERNA or the research councils or whatever, it is Government money, of course. That is our main theme in the research area, that there has to be a mechanism which defends the scientific research and gives us easy access if the national research programme is to be maintained.

717. Just at a time when the research infrastructure through last year's public expenditure supplement has received something of a knock?

(*Professor Butterworth*) That is right. That is why, your Lordships, we are hoping that you will comment about these matters in your report.

718. Thank you very much. You began by saying, Professor Butterworth, that you had four points you wished to address and I think probably we have not allowed you to address all of those, would you like to?

(*Professor Butterworth*) Yes, indeed. I would like to ask Dr Jones to move on to physics education in the schools and the impact on the small and medium technology based companies.

(*Dr Jones*) My Lord Chairman, thank you very much for the opportunity to talk about the application of the Superhighway in schools. We feel this is something which the Select Committee should

Chairman *contd.*]

take due note of. May I start by saying that our remit is to disseminate knowledge in the science and education of physics. Our programme of support for physics in schools falls neatly into the remit and we are well aware of the potential for the application of the Superhighway in schools, although the detailed way in which it would be used, even in six months, 12 months, let alone five years, is unknown. So much can be done to help and inform teachers and to enable pupils to learn and also to develop skills which are increasingly required in the modern world. The Institute is very pleased that the connection of schools and colleges to the Internet is high on the agenda of major political parties but we must ensure that the connection is high speed, also it must be ensured that the equipment which the schools have is up to date and not obsolete. I think that is essential. There is hardly any point in connecting schools to the Internet if they cannot make use of it. A point I would like to make in this area is that it will be a major task to train teachers on use of the Internet and the Web. We do have, within the membership, a great deal of experience and expertise in this area and we would be very keen in one way or another to make use of this expertise to help teachers. Finally, just to say in the area of schools we do hope this is an area which you will comment on, and that you will recognise the importance of making use of this development within the schools to the benefit of teachers and pupils and eventually, of course, to employment and the economy.

Lord Flowers

719. The whole of academic life is not physics, unfortunately. Do you think other learned societies will take an equally farsighted view towards their communities of teachers?

(*Dr Jones*) Of course I cannot answer for our sister societies but knowing the individuals who are concerned in running these societies I am pretty certain there will be a great deal of sympathy towards what I have just suggested.

Chairman

720. A concern that has crept up in this study quite often is that the Internet provides schools, school children and school teachers with access to an enormous volume of information of various kinds and various degrees of quality whereas a lot of the problems in the schools seem to be much more concerned with let us call it core training rather than access to interesting but somewhat peripheral information. Is the Institute playing any part in promoting the development of teaching material on core physics in schools?

(*Dr Jones*) We are indeed, my Lord Chairman. We are embarking on a major curriculum development exercise to bring new physics into the curricula. This is an exercise where we have done the consultation, the discussion and the debate and we are now, if you like, in the aftermath of the Dearing Report, planning to develop new curricula. Our objective is to have such curricula with new physics, modern physics and its applications in the curricula being supplied to schools by the exam boards at the turn of the century. We believe that we could make use of the Superhighway to deliver some of this material to schools.

Lord Craig of Radley

721. Could not that material be delivered through a CD-Rom without all the expense of maintaining a Superhighway connection to educational establishments? Why do you say, as you have stressed here, that the highest priority must be given to ensuring high speed access?

(*Dr Jones*) First of all, high speed access is necessary if you are actually going to do something sensible and interact and be able to handle the sort of information which we have in mind. To come back to the CD-Rom, of course much can be done with a CD-Rom but its disadvantage is that it can quite quickly become outmoded and outdated and with the on-line connection via the Superhighway we could feed up to date modern information into schools. I think it is very important that children do learn about developments which are happening currently within science. If I might say so, your Lordships, for too many years we have taught physics in schools which is largely 19th Century and only peripherally 20th Century and that must change.

Lord Flowers

722. I am delighted that you are doing things like this but there are some obvious dangers. I am very much concerned about the extent to which there will be froth rather than core, if you see what I mean, provided by the Internet and Superhighway generally, or CD-Roms for that matter. I personally believe that school children need to understand the core subject before they are exposed too much to the froth. I am also concerned about the fact that it is very easy for people to publish froth for that matter themselves, circulate it to schools or sell it or whatever, and some of it will be the most awful junk imaginable. It is important, it seems to me, that you are taking part because you will be setting some kind of a standard. Are you concerned about standards of content? How would you go about doing something about it?

(*Professor Butterworth*) My Lord Chairman, before answering that I think it would be interesting to hear some of the things that are done in the States which we do not have here. These are all items reported in the US National Academy's paper on "Realising the Information Future." In one example students in rural Wisconsin are able to use a supercomputer in California in order to do a ray-tracing project in computer science. They are doing three dimensional geometries so that you can actually move the objects around and you can move around the observer. In another example students at a US school are communicating with an Australian researcher from Melbourne who is an expert on Antarctica. This is not directly physics but there is obviously a physics content there. The students are actually, as it were, talking with this researcher in

Lord Flowers *contd.*]

Australia and are now looking forward to his going to Antarctica and going with him via the Internet. In another example a group of students doing astronomy and mathematics at school are communicating with a Danish group to try and understand the history and importance of Tyco Brahe. They are analysing images, from Mauna Kea, from the Big Bear Solar Observatory and the Hubble Space Telescope and so on. One of the things that the Institute feels very strongly is that not only physics but the whole of science is going through a very difficult period when people are not very excited by it. The ability of the school children to be up to date in material which is certainly much more up to date than they can ever hope to get in their own school library is incredibly stimulating and will be very important for maintaining the interest in science in the country. I think there is another aspect that is important and that is the impact on the teacher. The fact that he or she does not feel alone any more with all the problems that there are in the schools. He or she can now communicate with other teachers with the same sort of problems. I think that is of very great importance. I am absolutely certain that the use of interactive methods has a stimulation value that you cannot get from a CD-Rom. Of course you have to make sure that there are good standards, that we have not got bad players, as it were, on the network and so I think it is important that bodies like the learned societies have a very strong involvement, a very close relationship with the Department for Education and Employment to ensure that standards are maintained. But I am sure that we need the Web coming into the schools.

Baroness Hogg

723. Just to play devil's advocate for a moment. Those projects you described were, I am sure, very interesting and stimulating but is there not a danger that access to the ability to develop those kinds of projects will seduce both the teacher and the students further and further away from building the core curriculum in the syllabus so that they are spending their whole lives, if you like, wandering around the Antarctic before they have even learnt the geography of the world.

(*Professor Butterworth*) There is obviously a danger. We have these problems already in the universities, of course, where we have these facilities. In a good research university you have these facilities already. Of course what one does is that for a bit you allow your students to play games and do E-Mail messages around the world and you know that they are "wasting their time" but it is the way in which they learn how to use the system. After a time they decide quickly that it is more interesting to do something useful on the network rather than play games. I think the same must apply in schools but ultimately it does rely on having good teachers that are committed and a good arrangement with the Department for Education that standards are maintained.

724. I made the point perhaps more emphatically because we are at the end of a period where discovery based education has been carried a long way in schools, further now than people perhaps think was wise at the cost of core curriculum. So while I can see this in the university context, the nature of university education is to widen horizons, how far down the school curriculum do you really think that access to global Superhighways is an important part of education? Has science really become so "boring" that you need this kind of "gee whiz" to engage primary school children in the learning of science?

(*Professor Butterworth*) The view of the National Academy is very clear, they would like to go right down to kindergarten level so the American view is very clear. In our evidence, we limit ourselves to talking about secondary education.

725. Yes.

(*Professor Butterworth*) I believe there are very important things that can be done at primary school level but I doubt if it is of very much interest to the physics community, as it were. I think the interests are in general citizen issues, knowledge about the world and that sort of thing which are basically outside our competence.

726. Or is it possibly that you feel there may be a weakness of science teaching within schools so that interactive systems, maybe on a local group basis, offer the potential for raising the quality of science teaching within schools?

(*Professor Butterworth*) I think that is true, yes.

(*Dr Jones*) I think it is true that many teachers, particularly in primary schools, have little knowledge of science and great efforts must be made to train them, certainly because science of course is in the primary school curriculum. It does not only stop there: in secondary schools teachers get out of date very, very quickly. As an example we, as the Institute, introduced a pack for 16-19 year olds on particle physics and one of the major problems was that we had to train teachers before we could actually communicate this to the pupils. The Internet would have been a wonderful way of getting that information over to all the teachers in the land. If I could return to Lord Flowers' earlier question. We are very concerned, of course, about the whole issue of abuse of information and abuse of the Information Superhighway but the core is crucial and it is important. I would hope that the froth would be exciting but certainly should not replace the core knowledge which is crucial.

Chairman

727. Thank you. I think you had a fourth topic which you wished to mention?

(*Dr Jones*) If I may say a few words about the use of the Internet in business, in companies and industry, particularly in small and medium sized enterprises. Although we have no detailed information it seems that the application and use of the Internet in British industry lags behind its use in the United States. It was only yesterday that I read some figures from the American Physical Society which showed that of the 132,000 registered domain Internet addresses in the USA 120,000 are for industry and 2,000 for universities. That does not reflect the usage but I am certain that in the United Kingdom, although I do not have figures, it is

Chairman *contd.*]

nothing like that kind of ratio. The Institute has taken it upon itself to help industry, particularly SMEs, to use the Internet for technology transfer, networking, and indeed for finding trading partners. We have an SME Club and our intention is to provide pages on the Institute's web site for such SME companies to use. We are very interested in obtaining support through the Information Society Initiative of the DTI for this particular exercise. This comes back again to the dissemination of knowledge in physics which is what we should be doing according to our charter. Again it is an area which will develop and it is an area which is crucially important. In particular there is a great deal of education which is needed to get all companies, particularly SMEs, trained in the use of the Internet which do not realise what its potential is. We just wish to make the point that we are involved and we are seeing ahead what we can do with SMEs, not only physics based but technology based SMEs, and through our knowledge and experience with the Internet we will be able to help these companies come to grips with the potential of the web and of the Internet.

Lord Flowers

728. Is it your impression that larger companies can safely be left to look after themselves? Are they fairly advanced in making use of the Internet?

(*Dr Jones*) I do not think they are, my Lord Chairman. We feel that there is a particular problem with SMEs and this particular problem came to light when we did some work for the Department of Trade and Industry summarising the Technology Foresight Reports in such a way that SMEs would find them of use and of interest. The net result has been a huge number of enquiries, and a huge number of plaudits. So by producing such summaries in paper form we find that there is a market there and we do believe that it is a market which we can help and we can influence, perhaps more so than major companies.

Lord Butterworth

729. Where a major company can exist I think you have been trying to stimulate what you call an uncle-nephew relationship?

(*Dr Jones*) We have indeed, yes. We do have our corporate affiliate scheme where we have something like 25 of the major physics based industries in this country and also we have our SME scheme. What we are trying to do is to stimulate some kind of interaction between these companies, hopefully for mutual benefit.

Lord Flowers

730. It is early days and it might be useful if you could put on a piece of paper one or two examples where you have had successes already.

(*Dr Jones*) I can certainly put something on a piece of paper.

Chairman

731. As usual time has overtaken us. Professor Butterworth, would you like to make a concluding statement?

(*Professor Butterworth*) One point I would like to say is if your Lordships feel it would be useful, the Institute would be delighted if you were to visit our premises at Portland Place to have a demonstration of our electronic products. I think all I want to say now is to thank you for listening to us on a subject which we regard as of very great importance and for listening so patiently to us.

Chairman] Thank you very much. Thank you very much for the invitation to visit Portland Place, some of us might enjoy that but I am afraid we have a rather heavy programme of visits already. We shall have to consider it. Thank you very much.

Supplementary memorandum by the Institute of Physics

"NEPHEW-UNCLE" RELATIONSHIPS AND SMEs

The Institute of Physics runs two complementary membership schemes. The Corporate Affiliate Programme involves the major physics-based organisations in the Institute's activities, whilst the SME Club is targeted at the smaller company. Benefits of each of these schemes are focused on the needs of the different participating groups. Every opportunity is taken to put the two types of company in contact with one another, however, for the purposes of trade or mutal support. Examples of the ways in which the Institute has fostered such relationships include:

1. The Institute has, for some years, organised Business Briefing Luncheons for its Corporate Affilate members. Recent speakers have included Ms Barbara Beckett of W H Smith and the Technology Foresight Steering Group, and Mr Richard Caborn MP, (then) Chairman of the Commons Select Committee on Trade and Industry. In recent times, members of the SME Club have been invited to join these luncheons, providing them with opportunity not only to make Corporate Affiliate contacts, but also to present their views of an issue of common interest in an informal and enjoyable setting.
2. The Corporate Affiliates have sponsored some major projects within the Institute, aimed at promoting the take-up of physics at school and university, and at informing young people of the opportunities for careers in industry and business. We Chose Physics is a careers video recording for

schools, whilst the CD-ROM Scientists in Business, currently under development is an awareness package for those just starting out on their careers. In both cases the Affiliates have ensured that the material is both appropriate and beneficial to the smaller enterprise as well as the large. Representatives from the Corporate Affiliate Scheme and the SME Club have worked together with the Institute in putting together this important programme.

3. As presented in evidence on the Information Superhighway enquiry, the Institute has recently completed a major project to disseminate the findings of the Technology Foresight Programme and its implications for Small and Medium Sized Enterprises. In putting together this report, the Institute drew upon the expertise of its members from large companies, to produce material specifically for their smaller counterparts. Distribution to small companies has been enhanced through support by several Government Regional Offices.
4. The Institute's Home Pages on the World Wide Web (WWW) already make reference to our Corporate Affiliate member companies. Very shortly we will be implementing "hot" links from these pages to the Home Pages of the companies concerned. We have submitted a proposal to the Department of Trade and Industry's Information Society Initiative for support for a project in which we intend to prepare and maintain pages on our Web site for each of our SME Club members, providing them with an opportunity to use this new medium for trade and networking at no cost to themselves, under the guidance and support of the Institute.

The Institute is planning to continue its work in this area, aiming to exploit every opportunity to encourage the development of "nephew-uncle" relationships between its various corporate members.

May 1996

TUESDAY 21 MAY 1996

Present:

Butterworth, L	Hogg, B
Craig of Radley, L	Phillips of Ellesmere, L (Chairman)
Flowers, L	
Gregson, L	
Haskel, L	Gerard, L

Examination of Witness

MR ANDREW GRAY, European General Manager, CompuServe, called in and examined.

Chairman

732. Perhaps you would like to begin by telling us your role in the company and make any introductory remarks you would like to make?

(*Mr Gray*) I am the European General Manager for CompuServe. We have three offices in Europe, three main regions, the French market, the German market and the UK market, and I am responsible for Europe.

733. For those three markets?

A. For those three markets.

734. So you spend most of your time in London?

A. Actually our UK headquarters are in Reading, but yes, most of our time is spent in the UK and Germany.

735. Do you have any other introductory comments you would like to make?

A. No, I do not think so. I have a section of my presentation which gives a general overview of CompuServe in Europe and I thought that would be helpful and then of course I am happy and prepared to try to answer any questions that you might have.

736. Perhaps since you have prepared a presentation, we had better let you make the presentation, but you must expect to be interrupted if we feel like it.

A. I would be very pleased to be interrupted. I have included rather more slides in the material that I have provided than I intend to go through. I just thought some of the charts would be interesting background information for the Sub-Committee. I thought I would start with giving you an introduction to CompuServe in Europe. CompuServe is approximately a $1 billion organisation worldwide with about 3,500 staff, 700 of which are now in Europe and we have seven offices in Paris, Munich, Utrecht, Zurich, Bristol and Reading and we are expanding into Madrid and Rome. We have five million members worldwide using the information services of which now 700,000 are in Europe.

737. I should perhaps interpolate the point I should have mentioned to begin with, that you have three members in this room at least.

A. That is good news. CompuServe is very much the granddaddy of this industry. The company is 25 years old now and the information service is 18 years old. Things have changed of course very, very rapidly in the last three years. One of the issues that distinguishes CompuServe in this market from other people is the fact that we own and manage our own data network and I am sure this Committee is well aware of the importance of the physical connection in this whole Information Superhighway. If your physical connection is either unreliable or not fast enough, then any services that you might be trying to deliver to the business market or the consumer market are severely impacted, so having a reliable network is really essential. We have an approach whereby we manage and maintain our own data network throughout the world and, in addition to that, we interconnect with other companies who are very much in the network business. Here is a list of organisations that are very much in the access business and will almost certainly be major players in the physical provision of Superhighway band width, if you like, organisations like British Telecom, GNS Dialplus with a network here in the UK, Mercury which we use extensively, MFS, which is the Metropolitan Fibre company, and France Telecom and Deutsche Telecom who are all major players, so we are not expecting to compete with those people in the longer term for providing band width. Our position is to provide services into the home or services into the business, but with the industry in the state it is in at the moment, it is actually still a great advantage to us to be managing and maintaining our own data network and probably will remain so for the next two or three years. This is a chart showing the worldwide growth of CompuServe. It does not go back to our origins, but the point I would like to make about this chart is that it took us 13 years to acquire one million members worldwide, most of which were in North America, but it then only took two years to acquire the next one million members and then it took only 18 months to acquire the next one million members and this is representative of the industry at large.

Lord Gregson

738. You did say you have 700,000 European members out of five million, so you are still very unbalanced at this point in time.

A. My next chart shows—

Chairman

739. Could I ask, as a follow-up to Lord Gregson's question, to what extent has the rapid growth since 1993 reflected the growth in the international interest

Chairman *contd.*]

in the Internet to which you provide access and do people come to you mostly for Internet access or mostly because of the special services that you provide or a mixture of the two?

A. The distinction between commercial services and the Internet is really blurring and there will be no distinction within about twelve months' time and the only possible distinction you could draw is, "Here is a service on the Internet that somebody is trying to charge money for. Therefore, it is a commercial service. Here is another service that is free and, therefore, somehow is different from this other service". Today and for the last 17 years there has been another big distinction which is one of technology where if you are using CompuServe it looks different, but that distinction is going away very, very quickly and all the companies like CompuServe are adopting the Internet as a technology very, very rapidly. In our case, by Christmas this year everything that you do with CompuServe will look and feel exactly the same as if you were doing it on the Internet. At the same time there are sites on the Internet which have been growing on a non-chargeable basis which are approaching the point where they are trying to figure out how to start charging for their services, so it is a common perception, and an understandable one, that there is the Internet and then there are commercial services, but that is very short-lived.

740. So what will distinguish you from service providers that rely entirely on the Internet?

A. The market is segmenting or fragmenting into people who will provide access, the major players of which are probably the PTTs, and the people who will provide services and it might be customer support, it might be aggregation of content, the physical delivery of the software and documentation to the customer base, and then the people who are delivering content. At the moment in most of those categories there are companies which do some of the other categories. For example, British Telecom will not only provide access, but they will also provide some content and they may be unclear as to what their long-term future is, whether it is as a publisher or as a support organisation or as an infrastructure company. At the same time there are publishers who have started out in the industry publishing content often for free who are now trying to figure out how to make money out of that content and in the process are starting to provide more services, more customer support, more software, so what we expect will happen is that people will start to focus more and more on their core competencies and that the PTTs will eventually own the access portion of the model and it would not in the long term be very dissimilar to a high street shopping experience. You drive along a particular road to get to the shop and you shop in Sainsbury's partly because there are some home brand products that are good value for money, but also mainly because there is a wide range of all the other products that you would want. So CompuServe's unique position as we go forward will be in providing the services and support which is obviously customer services and the aggregation of other people's content.

741. So to what extent, going back to Lord Gregson's question, is the US market saturated from your point of view and to what extent does your growth depend on an expansion in Europe and other parts of the world?

A. It is not at all saturated in the USA. The US is growing at about 40 per cent a year and we are growing at about 100 per cent a year, but overall the industry in the USA is still growing much faster than that 40 per cent and the figures I have been seeing are more like 80 per cent a year.

Baroness Hogg

742. Just to pursue this point about the core competencies and to take up your Sainsbury's analogy, I am still not clear whether the future you are describing for your business is as a Sainsbury's which is concentrating on home brand products or as a supermarket offering a range of other people's products.

A. These publishers, the people who are putting content out on the Internet are approaching the threshold where they have to start making money out of this content. They make money out of it through their traditional vehicles, but they believed that they would be able to make money through their digital products simply by advertising. In one or two cases that is proving to be the case. In most cases it is only proving to be a source of revenue, not sufficient revenue, so organisations like Time Warner in the States, who run a very large service called Pathfinder, are starting to put a tollgate on that product saying, "You have to pay". Organisations like CompuServe then go to Pathfinder and say, "We want to bulk purchase five million subscriptions to your product" and of course you get a very good price for that. It is the same sort of commercial transactions that no doubt Sainsbury's are doing and that, I think, is the way that the industry is going to develop in the foreseeable future.

743. Yet a moment ago you were emphasising the importance of having your own data network. Are you saying that that was important in the early growth of CompuServe, but will now fade out and become less important?

A. Over the next three to five years and as soon as we could obtain a reliable network from the PTT, we would choose to do so because it is an extremely capital-intensive activity, but my first point was that if you do not control that network link, your end customers do not know or care about where the problem is in the chain and you are only as strong as your weakest link. Today the access piece of this whole industry is extremely weak and I would say probably the content piece is quite strong and there is a lot of very enticing content, just to answer your question, which is why it has been growing so rapidly in the last few years. More and more PCs are getting into the home, but that is a general trend, and more of those PCs are equipped with modems, and that is another positive trend, but the most important trend is that there is now compelling content and people are getting drawn on to the Internet and they are being told that so and so has an interesting web site and that is relevant to their particular leisure or

Baroness Hogg *contd.*]

professional interest and all these factors are working together, plus, because of competition, the price is coming down, so it is not surprising to see such a rapid growth.

Lord Craig of Radley

744. I was very struck by this membership growth which reflects a very rapidly growing revenue stream. I notice that later on in your slides you talk about various freebies to encourage even more growth, but what I have not quite got a feel for yet is where this revenue stream is going to be most pointed. What do you see as the value to the customer which this growth in membership is going to provide? Is it more of the same or is it a new variation?

A. It is more of the same, but one of the overriding trends in the industry is that it is becoming more segmented so that whereas in the past you might have joined CompuServe or America Online or MicroSoft, in the future you are much more likely to be joining Medics Online or Accountants Online which might be built and managed and operated by CompuServe or maybe by somebody else or maybe by the professional body concerned, but your on-line time will be far more focused and one of the biggest problems we have today, as do all our competitors, is that it is all too big and it is like walking into the British Library when all you really want to do is go into Waterstone's. It is too big, so it will become more segmented. We are in the process of preparing much more targeted products for specific sectors of the market and the first sectors are, on the one hand, professional sectors, like doctors, lawyers and accountants, and, on the other hand, they are lifestyle sectors, children, teenagers, those sort of things.

Lord Haskel

745. That was precisely the point I was going to ask about, whether you have envisaged the service providers providing services much more focused on markets. Will your service then include taking people around different sites on the Internet appropriate to their particular interest, be they doctor, accountant or whatever? Incidentally, I may say that you may probably know me better as 1066.1610.

A. We are certainly trying to do that. As I said before, it is an overriding concern and the feedback we get from customers all the time is, "I am lost and I need somebody to hold my hand", and the advances in technology, features, do not help us in that process because, as you will know, computers get more powerful and more complicated and all our efforts in making them easier to use get overturned by other people who are in a sort of feature explosion, so we are nowhere near a mass consumer market for our product or anybody else's product at this point. This product today is far too complicated for the broad market, but all our energies are being focused on addressing that issue, not on acquiring more content and not on necessarily even making it cheaper, but we are trying to make it easier to use. I have included a slide which simply shows you the distribution of the membership and you can see that 20 per cent of our customer base is in Europe. This shows our growth rate in Europe which follows the same basic profile as that of the US.

Lord Gregson

746. That is the percentage you have predicted for next year, but it is 14 per cent this year.

A. I am sorry?

747. Your membership in Europe is 14 per cent this year, not 20 per cent. It is only 20 per cent if you project it to next year.

A. The 20 per cent figure takes out our Pacific Rim activity. Let me put that slide up. Out of our five million members, we have over one million that are in Japan and these people are not using the same product, but they are using a Kanji-based[1] service called Nifty Serve for which we receive licensing revenues, so we count those members, but in most cases what people are interested in is what proportion of on-line members are in Europe and today that is about 20 per cent. Interestingly enough, by the end of next year, it will be more like 25 per cent, so Europe is definitely growing faster than the USA. This next slide shows the distribution of our membership throughout Europe and it represents or reflects the fact that we have been in Germany and the UK for six years, so we have developed a certain amount of name recognition and we have momentum in terms of marketing programmes and we are in most of the modems sold and we are in most of the PCs sold. In other countries in Europe we do not have physical offices yet and those types of marketing programmes have not begun, so this is not intended to represent a true reflection of the market opportunity and clearly it does not. So today in the UK we have 300,000 members and again this slide is showing the picture at the global level where our main competitor is America Online, known as AOL here in Europe, and you will see some other names that perhaps you come up against, Prodigy, MicroSoft Network, Europe Online.

Chairman

748. There was a time when you were very worried about the incursion of MicroSoft into this field. Are your worries allayed now?

A. No, not at all. They are still a major competitor. MicroSoft are playing in the aggregation and support category where they are a direct competitor to us, but they are also a major publisher now and they do not just license other people's products, but they are a publisher and that is perhaps one thing which will help us in the longer term because very many publishers are uncomfortable about working with MicroSoft simply because they are expected to be competitors. This then is the picture in Europe today. America Online have only just got started in Europe, Prodigy are not here, MicroSoft have been here for a while, but they have a very poor product and they are trying to focus that. Europe Online have quite a lot of name recognition, but practically no membership base.

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[1] Japanese character set.

Baroness Hogg

749. In the particular language markets of Europe, are there others not listed there who have a high market share, say, in the French market or the German market?

A. No, basically not. The two organisations that are not on this chart and you might think perhaps they should be are Minitel of France and what used to be BTX in Germany and are now T Online, but both those services have millions of, or T Online have one million, members, but to date they are still videotext services and they are not targeted at PCs and really they survive off, more than anything, home banking. Now, they are obviously in the process of trying to migrate their solution to being a broad-based solution to provide full Internet access and aggregated services, so they might become competitors and the fact that they are both owned and operated by PTTs is an advantage to us there because they are moving very, very slowly.

750. What about the cable companies, for example, in France?

A. Well, again we certainly do not see them as competitors today and we would far more likely see them as partners in the future because although initially they might start to provide some content and some aggregation of content and some organisation of the Internet, that is not going to turn out to be their real strength, so I think very likely what will end up happening is that they will provide access and they will promote CompuServe or a service like that over their cable networks. Let me move on now to some key profile data for CompuServe customers worldwide. I think this is fairly representative of the industry to date. It is a very mixed usage which comes back to an earlier point I made about the segmentation of this market. At the moment it is very much a case of one suit fits all and really nobody is being very well served by that. Businesses are not getting business products and teenagers are not getting the product that is targeted for them either. Sixty per cent of the traffic is in the evening and 40 per cent is in the day which is the best indication of the type of usage the service is being put to and when we ask members how much dual usage they have, it is growing year on year, so in a few years' time when I ask that question, I would expect to be told, "I use my calculator at work and at home. What a strange question". It will become like that and whether you get introduced to on-line services for some professional usage or because you are trying to get a ticket for the theatre, you will transfer that usage into the workplace or back into the home. It is a relatively affluent membership base today. I think it used to be the case that the product was relatively expensive which would tie up nicely with the fact that it was an affluent membership base. Today the product is not very expensive, it is £6.50 a month, but the sort of people who are on the leading edge of technology in general do have quite an affluent profile, so I think that is really the reason why the membership base today is quite affluent and well educated.

Lord Gregson

751. You do have a very high capital cost though even before you start and that is much more important, is it not, on that basis?

A. Yes, for the home PC, £2,000 is really the entry price.

Lord Gregson] So that is the main reason why it is blocked to the A/B sector in effect.

Lord Flowers

752. That is your profile of your members, is it?

A. Yes.

753. How does it compare, do you have any idea, with users generally?

A. Certainly the split between evening usage and daytime usage is very similar and in many cases it is more accentuated in these others. Most of the access will be in the evening and most of the growth in this whole industry is on the consumer/leisure side and not so much on the business side.

Baroness Hogg

754. Is this a global profile or a profile of your membership in the UK?

A. It is actually a profile of the membership in the UK, but it is almost identical to the global figure. It is changing as the membership base grows. We talk about acquiring customers further down in the pyramid which means that they are less technical, they have a lower or less technical expertise and in general they tend to be less educated and less affluent, but still overall it is a very affluent and very well-educated membership base.

755. I am surprised that the median age is as high as 38. Is it going up or down?

A. We have more customers over 50 than under 30. The Internet in particular had an image five years ago of all teenagers and students and there was no business or professional use for on-line services at all and nothing could be further from the truth really.

Lord Gregson

756. There must be a lot of unrecorded usage by young people though in universities, et cetera, where they get on-line and it is a major problem in the universities to restrict the cost.

A. Well, the universities are almost always hard-wired so they have a permanent connection from the university into the network so they would not be incurring any sort of variable costs. This whole growth in the industry is in dial-up traffic so these are people who are accessing from home and the usage of Internet in the academic environment I believe is growing quite slowly because it has been saturated some time ago. I was asked to comment on any government actions that might help to develop the information society. The first point I wanted to make here is that relative to our other European neighbours, the UK have done a great deal already to stimulate this market. CompuServe finds it easier to operate in the UK than any other European country and it is for several reasons, but not least of which is that the PTT environment is deregulated

Lord Gregson *contd.*]

and we can get much better prices for network from Mercury and MFS and British Telecom than we can from the likes of Deutsche Telecom and France Telecom who are still trying to compete in one sense and trying to serve you as the customer at the same time as they are trying to compete with you. Just to give you some idea of the economics of this business, there is a huge proportion of it which goes into access, so that out of the approximately £6 or £7 a month that a customer would pay us, £5 would go into the physical network straightaway, so it is a huge piece of business.

Lord Haskel

757. What is ISDN?

A. That is the digital telephone technology which British Telecom are promoting and have been for a while as a very good business solution, but they are not promoting it at all into the home and other European countries are, most notably Germany.

Lord Flowers

758. Do you consider it is a bad thing that they do not?

A. Yes, I do. I think really as a nation, they should be asked—

759. But what sort of ISDN usage is there in France and Germany?

A. Perhaps I could follow up with some specific figures for you, but our network in Germany, we see well over 50 per cent of it is ISDN. It is more expensive in Germany to get analogue, the old-fashioned telephone connection, than digital and it is significant from the growth of the industry's point of view that because of these things, the most obvious thing is that it is somewhat faster connection so you can do more things, but that is an ever-ending race. The bigger the pipe, the more—

760. But BT may simply be saying, "We know perfectly well that much higher-speed connections are coming along soon so why should we do much about ISDN in the meantime?" I am not speaking for them, you understand.

A. Well, I am not hearing them suggest that anything other than ISDN is the next step. Everybody is telling me that ISDN is the next step, and that is certainly what our European neighbours are doing and into the home, into the business environment, it is ISDN and it is nothing else. If BT are saying they want to leap-frog that technology altogether and put fibre-optics straight into the home, we would love to hear about that, but the advantage of ISDN is that perhaps one of the pre-requisites of this technology is that we are not talking about new wires into the ground, but provided you live reasonably close to one of their exchanges, you can get an ISDN line installed.

761. But given that there is ISDN in businesses at any rate, are you able to give us some sort of take-up figures? What proportion of business usage is ISDN, for example?

A. Very light and certainly for our on-line services it is very low, less than 10 per cent, but the significance of this in the long term is, as I say, that it is a higher-speed connection so you can do more things, more high-quality images, for example, and perhaps even some moving images. Perhaps more importantly from the consumer point of view is the speed of the connection. If you have an ISDN connection and you want to connect, you just say, "Connect" and you are connected and there is none of this sort of hanging around, so you can design applications which take advantage of that and you do not stay on-line all the time.

Lord Gregson

762. We saw this at Northern Telecom, a very high-speed switching.

A. It is digital technology, so almost inevitably it is a more reliable product. We have hundreds of thousands of telephone calls from customers who are having problems and a lot of those are to do with the analogue telephone network where they have a noisy line or they have a dropped connection or things of that type, so a shifting to digital technology is important from that perspective.

Lord Flowers

763. It has been put to us, and I would like to have your views on it, that the regulatory regime in this country is one which does not take proper account of the global nature of the Superhighway or the Internet and tries to deal with regulation in this country as if it were a purely British problem. Have you any comments or is the rest of the world just isolated from the UK?

A. I think it is definitely a global industry certainly. Our piece of it is the provision of information. We can host this information anywhere in the world and acquire it anywhere in the world and deliver it to your home.

764. But is the rather local British orientation of the British regulatory system something that works against you?

A. I have not had any experience of that, I would certainly say that, but I could imagine that there is some truth in what they are claiming, but I certainly do not have any knowledge of that.

Baroness Hogg

765. It depends what global regulatory framework you end up with. If you ended up with one more like the European regulatory framework at the moment, you might then achieve globalisation at the cost of a higher level of regulation.

A. That is certainly the case and whatever we have done here in the UK, the prices are definitely lower than elsewhere in Europe and that certainly allows us to have lower prices.

766. You were saying earlier that this market is content-driven, pulling people into services, where people are being pulled into networks by the development of services. Why is this not pulling through a shift to ISDN if there is a quality difference in accessing networks through ISDN?

Baroness Hogg *contd.*]

A. I think ISDN, because it is a technology product, it really does not do anything for you unless you understand the technology functionally. It is just the same as a modem and not many people know what that is either, but it is really a technology that needs to be marketed and pushed and consumers need to have it explained to them that this is a sensible thing for them to do. In Germany the situation is reversed and the way it is priced, it is the obvious thing to do because if you want to get some old-fashioned analogue technology, you have to pay for it, so consumers do not have to go through that decision-making process.

767. Why should Deutsche Telecom take a decision that way and BT the other?

A. I do not know about that. Every time I meet somebody from BT I ask that same question, "Why are we doing that?"

Lord Flowers

768. Could that be the regulatory system?

A. The most frequently presented explanation is that British Telecom make a lot of good money from what are called leased lines with one business having a permanent connection with another business who buy a 64k leased line and this ISDN technology will to some extent undercut that market for them because that connection between your office and my office does not need to be permanent any more and it can be established just when I need it.

Lord Gregson

769. One of the explanations we were given was that there is more commercial use of the Intranet rather than Internet and Intranet does not need it.

A. That is certainly true.

770. There is no drive for commerce to go beyond the Intranet at this point in time.

A. I would certainly dispute that. I think there is a great deal of growth on the business side of the Internet. It is also true to say that there is a lot of growth in the so-called Intranet, the use of this technology just within companies, but those are the large companies where they have those problems of co-ordination and communication.

Chairman

771. Does it have something to do with the nature of the content? I was surprised to hear you say that from the point of view of the user, apart from these problems of untoward disconnection and so on, you can hardly tell the difference between ISDN connections and the normal analogue connections in this country and if there were much more genuine multi-media with video clips and such like, then ISDN would be markedly different?

A. It is not sufficiently so. It is faster and you can do better things with it, but it is not an order of magnitude faster, so to go to a broad-band experience, this industry today is what they describe as "narrow band", and do not ask me what the distinction is between the two, but ISDN is still a narrow-band solution and it is not broad band, so you are not going to get full-screen video at the rates that you would like, but you could down-load files more quickly and get higher-quality still images and you could get better video images, but they are still not of television quality, so it is a step in the right direction, but the primary reason for moving to this technology from my own perspective is more to do with the overall end-user experience which has something to do with speed, but it is mostly to do with time to connect and reliability of the connection. I think that we urge the Government to show good leadership by example. I would like more and more government departments communicating electronically and having a presence on the Internet. We are seeing some of that, but it has still got a long way to go. I would like to see the Government investing in education as much as possible and showing government support for PICS, which is Platform for Internet Content Selection. I have a slide on this later on, so I would like to come back to this. I would like to see an encouragement towards inward investment. My first comment here is that I would repeat that just from the European perspective, we definitely find it more attractive operating our business here in the UK than in France or Germany both from the legal point of view and the tax point of view and the employment perspective, so frankly I think we are doing a lot of things right, but that does not mean to say that there could not be some improvements. I was asked to comment on the impact of business productivity. Basically CompuServe makes no claims that this technology is going to create a massive boost in your productivity. I think companies ought to expect some productivity gain, but the biggest impact is a structural one. Product development and project lead times can certainly be reduced. I think anybody who has started to use electronic mail, you often find yourself communicating with somebody two or three times in a day, whereas that sort of communication might have taken several days or a week prior to that, so, generally speaking, projects get accomplished more quickly and everything tends to accelerate, which is one of the problems of working in the industry, to be honest, that you find yourself running faster and faster, but that, I think, is one of the genuine gains. The traditional methods of customer communication can be improved. In very rare cases the technology is going to have a fundamental impact on the distribution mechanism and in some cases it is going to cut out the middle man and have some dramatic impact of that type, but in most businesses, it is an adjunct to the business that they have been conducting successfully for many years.

772. Nevertheless, your current advertisements do claim that it produces a massive boost in productivity.

A. Speak to our advertising agency! One area for discussion is electronic shopping. We have had an electronic shopping area on CompuServe for over a decade and it has been an American area. A year ago we expanded it to incorporate the UK area. These are the organisations (*indicating*) that came on-line with us a year ago to form the nucleus of this on-line shopping area. It has been very successful. We have

Chairman *contd.*]

had £1½ million worth of retail sales in the shopping area in one year with an average order value of £45, with 700,000 visitors in the area. Some products do a lot better than others. This whole issue of electronic on-line shopping has far more to do with habits than it has to do with technology. People are prepared to order flowers on-line and in fact Tesco do very well with their wine selector, but people are not prepared to buy insurance on-line yet and they are not prepared to or they do not buy books on-line either because WH Smith are not doing very well.

Lord Gregson

773. That figure of 700,000, many of them are repeats, are they not?

A. It includes our American customers. It is the worldwide customer base, so products of this type, being in English, they do attract—

774. And "UK Shopping Centre" is the headline.

A. Yes. It is the UK Shopping Centre with 700,000 people. How many of those are UK members, I would guess probably about half of them and the rest are American.

Baroness Hogg

775. It is a very high visit:purchase ratio, is it not? If I try and do the sums, it is an average order value of £45 divided into your £1.5 million, so it means they are making a heck of a lot of visits to make one purchase, are they not?

A. Yes.

776. The other question I would very much like to ask about this shopping experience is how much of the actual ordering is then being done on-line and how much is done telephonically?

A. It is all online. I have a slide to show basically how it works.

777. I have seen some of these where there is the alternative of ordering online or it gives you a telephone number. We have been told by some people that the predominant use still is that people use the telephone number to do a credit card transaction in that traditional way. Are you saying that is not the case?

A. That is not the case. This graph shows the basic structure for electronic shopping. A customer browses an online store. We are storing information about all the products, the prices and the descriptions which are provided to us by the vendor. Then the vendor logs on to our services on demand once a day, twice a day, three times a day and retrieves the orders that have been placed for their products and then the vendor collects the money for those products in the normal way. This is not Cyber cash, it has got nothing to do with this very high profile given to electronic cash and the impact of this technology on money. This is traditional retailing. The only difference is you are collecting the order and communicating with the customer electronically. You are not collecting cash electronically.

Lord Gregson

778. How do you transfer the credit card number then?

A. The customer enters it into the software.

779. So it is an open network?

A. No, it is through our own network. It is relatively secure. Again, there is a very common misconception that what is holding up electronic shopping is some sort of technology issue. The fact is that the transfer of credit card details online is far more secure today than in the real world. You go and buy some petrol in a petrol station and you give somebody your credit card or you give it to the hotel clerk and your card is frequently out of your sight, the little tear-off slips are in the bin. It is not difficult to get somebody's credit card number and signature in the real world. In the electronic world today if the transaction is not "so-called" secure it is then possible, if you know what you are doing, to eavesdrop on that conversation and extract the card number. There are technical developments that are making the whole online transaction more secure. In reality we are already in a much more secure environment than the real world and the thing that is inhibiting the growth of online shopping is habits. Of course, one of the things that is inhibiting the habit is this fear of security. I am not saying it is not important, but the answer is not a technical one, the answer is more of a marketing and public relations one.

Lord Craig of Radley

780. The retailer as much as the consumer wants to be certain that the card number he is getting is a genuine one and not one that has been pinched. Is there any difference there in your view?

A. Basically not, no. We do some analyses of the card number to check that it is conceivably a valid number but we do not authorise the card. The vendor does that in the normal way. As I say, although in the future you can envisage the introduction of digital cash, that is definitely going to be phase two. The growth in electronic shopping is going to be a growth that is of a marketing basis, where people are advertising their products electronically and collecting orders electronically, but the back-end systems are traditional back-end systems.

781. You point out the success of those shopping complex areas. What I would be interested to know is whether you have got a large number of retailers queuing up to become part of that arrangement. In other words, is the retailer side of the market expanding as quickly as the consumer side?

A. Yes it is, very much so. We are shifting this product, as all our products, from the propriety technology to the Internet because retailers want to reach the broadest market and they do not care whether you are a composite member or a Microsoft number. Today this UK shopping centre can only be seen by people who are composite members so it is quite obvious that we want to move into the Internet as quickly as possible, but it is also obvious that retailers do not actually want to be in the business of

Lord Craig of Radley *contd.*]

developing software and in most cases managing the data centres.

Lord Gregson

782. If it is so secure, why do you stress the American restrictions on encryption technology as being a serious issue?

A. I have been struggling for a while to try to figure out ways of allaying people's fears as to the security of online transactions. On the one hand I would say it is actually not that important because in the real world things are even less secure, but, on the other hand, from a PR perspective we need to be able to go out and build confidence and one of the ways of doing that is to say, "This is a government approved encryption technology, it has been used in cash machines all over the country for 20 years. You can trust it as well."

Lord Haskel

783. Can you tell us something about the security on the TSB-Lloyds Bank service that you offer?

A. Very technical solutions to security exist and have existed for a long time and they are very secure. The banks would not be doing this sort of thing if they were not absolutely confident. The TSB launched this with us on Tuesday last week and this product provides you access to your account, it allows you to transfer money from account to account, it is conducted over the Internet, it is not on a proprietary network and it is a secure transaction. They are basically using the same security technology that they would use in their cash machines around the country.

Lord Flowers

784. Does it use so-called "pretty good privacy"?

A. PGP? No.

785. Is this a higher level of security than that or lower?

A. It is higher.

Baroness Hogg

786. You mentioned earlier that some products were not selling well, books, for example. Is it too early to draw conclusions about what the driving forces of electronic shopping are? Are they too highly priced, for example?

A. The conclusions in many cases sound remarkably familiar because retailers and businesses approached this industry in many cases for the first time about two years ago thinking that it was very different from what they had done before. We charge for our content when we print it but we are not on the Internet, we will give it away and somehow we can treat this as a separate market and retailers were doing the same thing, they were not focusing on the traditional values of retailing which is position, position, position and price. So we had W H Smith trying to sell books and Virgin Megastores trying to sell CDs at a price higher than you could buy them in the shop and we were having to explain to these people that this is traditional retailing, the only thing that is different is you are talking to the customer at a distance. The position and design of your shop are vitally important. I think it is going full circle and businesses are becoming much more realistic about the positioning of this technology. They are seeing it much more as just an addition to what they are currently doing. Maybe they can use it to save money, to improve levels of customer support. There is an expression that says, "Take your business to the Internet, do not develop a business on the Internet." I think too many businesses were trying to do the latter.

787. On the security issue of authentication in particular, a number of witnesses have described to us the development of the use of trusted third parties for authentication. Do you use that? Do you see a need for that?

A. We will be, yes. The Internet society at large is pushing towards a common standard for authentication. There is an interim period. Today we are in a position where the transaction between me and somebody else is secure in that if anybody eavesdrops on it they cannot figure out what is going on. We would like it to be more secure. We would like to use the US security systems which cannot be exported. I think you know about that. It is nevertheless secure. What the user cannot do is prove to the computer at the other end that they are who they say they are and the computer at the other end cannot prove to the user that they are who they say they are. So if you are trying to purchase insurance from Royal Insurance you cannot be sure that it is Royal Insurance out there. It could be somebody pretending to be. The technology that you are describing will be with us in about 18 months' time and broadly used in about two years and at that point I will be able to prove to the computer at the other end that I am who I say I am and vice versa. In the meantime there is a technology called "distributed authentication" which is being widely used and it is being used by CompuServe in the next few months. I talked earlier about how a content provider is going to start putting up tollgates and saying, "To get to this content you have to purchase it and it costs £1 a month." They are also going to be saying that if you are a composite member your toll has already been prepaid and you can come in. To do that we are using this technology called distributed authentication which will prove to the third party computer that you are a composite member and that you know your user ID and password and then the third party will pass the charges on to CompuServe, not to you.

788. So you are the third party in this instance, are you?

A. You will get one bill from CompuServe with your CompuServe charge and then your Time Warner charges as well all on one bill. That is an interim technology. The ultimate solution is probably two years away, but the ultimate solution is the most far-reaching. I think it is absolutely amazing to consider that you can communicate with a computer on the other side of the world and prove to them that you are who you say you are and vice

Baroness Hogg *contd.*]

versa. That is something that is very difficult to do in the physical world.

Chairman

789. Our time is running out but there is an important issue to discuss yet.

A. This is the issue regarding content in general. We try hard to try to distinguish between two separate categories here. There is content that is only suitable for adult markets which is not illegal. It is only illegal if it is distributed to minors and there are rules as to what sort of content can be distributed to minors. It is different in different parts of the world. There are generally two classifications of contents. There is content where society will say, "This is plain illegal", and then there is content in which society will say, "We do not want this getting into the hands of children." The issue gets blurred too often. Our position with respect to adult material is we need to create tools that we then give to the parents which they themselves use to control what their children see, so we distribute a product called Cyber Patrol. This technology called PICS is just being adopted as an industry standard and it is targeted explicitly at this issue of adult material. The idea is that people who are publishing content on the Internet will classify it and they will say, "This contains nudity", it is a certain type of nudity and then as an end user my software will check the classification of it and if my profile that has been set up by my parents does not allow me to see nudity then the software will not allow you to see that content. It is a fairly simple concept.

Lord Flowers

790. What faith have you that providers will play the game and classify their products properly?

A. I think it is going to happen for two reasons. The first one is that organisations like CompuServe have a vested interest in promoting it progressively because to the degree that we can prove that we have parental controls our legal liability is improved. It is still, frankly, a vague area, but if you are a newsagent, for example, and you are putting *Playboy* on the top shelf with a banner on it then your legal liability is much better than if you have it mixed in with all the comics. Basically that is what is happening here. We are promoting it. The other thing is that from a publisher's point of view it is the same thing, their legal liability will be improved if they classify their content accurately. If they do not classify it at all I strongly suspect that they will find that they are more liable than they would otherwise be. I think it will be adopted.

Lord Gregson

791. The encryption for PICS is already published.

A. To my knowledge it is an open system. It does not rely on any encryption technology. PICS is an architecture to start off with, it is not the classification system itself.

792. It is a simple number sequence into the software at the receiver's end.

A. It is not an encrypted communication.

Chairman

793. Is it not a password system? So little Willy has a password and his father does not have a password, is that correct?

A. Yes, at the so-called client side. The software on the PC has to prevent access to the profiles, certainly.

Lord Gregson

794. Hackers' paradise!

A. That is not part of the PICS standard. If you go to a site that has been classified with PICS you will see, if you look at the code, quite plainly how it has been classified. That is not encrypted. It is just the same as if somebody had stamped the front of their magazine saying, "Adults only".

Chairman

795. Or the same as the classification of films perhaps.

A. Indeed. RSAC, the Recreational Software Advisory Council, whose classification system we are promoting, was set up two years ago because parents were concerned about trying to select video games for their children, was it violent, was it anti-semitic or whatever.

796. How would this have helped you in the Bavarian case?

A. In that case the issue was to do with the distribution of adult material to minors. The material itself was not illegal and so to the extent that we could show parental controls we were off the hook and, in fact, prior to that case we did not have Cyber Patrol[2] so we were distributing a product that you needed a credit card to access, so really you had to be an adult to have a credit card, so there was some control but there were not overt controls.

Lord Flowers

797. The bottom line is what you have got as your bottom line, is it not?

A. Yes. In this field our approach is to give the parents the tools, educate them, make them realise that it is an important issue for them but let them decide.

Baroness Hogg

798. Do you think that really can be sufficient as an approach? After all, we have a long history of taking a different approach to television where yes, ultimate responsibility is with the parents but there is a watershed, etcetera, etcetera and producer guidelines on how children's programmes are made and so

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[2] A software product offering improved parental controls over Internet context.

Baroness Hogg *contd.*]

forth. Do you think just a broad statement saying that it is parental responsibility will work?

A. It is not going to be the only solution. We ourselves are promoting in the USA a product that is targeted specifically at children. It is a product called WOW![3] in the States and we will be doing something like that in Europe quite soon. With that product, which is targeted specifically at children, it is more like *Blue Peter*, there is what we call a walled garden, there is no content in there that we have not ourselves vetted. We are taking responsibility for that. This issue has to do with if you provide people with access to the Internet at large then how could you improve the situation. It definitely is not the final solution. The one distinction between this technology and the television which I think is worth remembering is that you have to go and get something. You do not sit there playing with your jigsaw and all of a sudden there is an advertisement broadcast at you. You have to be sitting there, actively go to a site and look at the content.

Chairman

799. I am afraid we are running out of time rather seriously. Do you have one final point you would like to make?

A. My final point is on the issue of the stuff that really is illegal. PICS is not a solution. You cannot rely on criminals to classify their content. I have no solution. I can explain to you what our position is, which is as an access provider we do not believe we should be held responsible unless we are informed of some illegal activity.

Baroness Hogg

800. Is that not an encouragement for you to turn a blind eye?

A. It is just like the telephone. We try to position ourselves just like the PTTs. If we know nothing about the fact that a great train robbery is being planned over our phone networks then you cannot possibly hold us responsible, but if somebody comes to us and says, "This illegal activity is taking place on your systems", then provided we can do something about it and we have the right and practical ability to do something about it then at that point we start to accept liability, but until that point we believe that we should not be expected to have any liability which then leaves the question of who is liable.

801. I am a little worried about the subsidiary clause, "without affecting our 'innocent' content, service or performance."

A. You mentioned the Bavarian case. There is another case we have in Germany at the moment which is another very good example of this which is in Mannheim. In Mannheim the issue was about a Canadian publishing anti-semitic information in California which was, as far as the German authorities were concerned, being published by us in Germany and there the information was legal in every country around the world except in Germany. We argue that we are not publishing it because people have to actually go and retrieve it, we are not broadcasting it in any fashion at all. Secondly, we could not remove that content without removing a lot of other innocent content. One of our competitors, the German Deutsche Telecom system, blocked access to it and in the process they removed 2,300 other content providers. The next day the information was replicated by a lot of the academic institutions throughout the states, it was available on MIT and UCLA and there was this war going on and the US Internet community was saying to Germany, "If you want to block this content you are going to have to block most of the Internet", so it was a stalemate, basically.

802. Is the Mannheim case completed?

A. No, it is not. People are still trying to figure out whether if they put information on the Internet in California they should be somehow construed as having published it in Germany. From my perspective it has everything to do with the fact that you do not actually publish anything, you have to go to get it; a German customer could also pick up the phone and talk to Mr Ernst Zundel.[4]

803. But you have to go and get a book.

A. How do you incorporate this sort of thing in law? I do not know, it is very very difficult.

Baroness Hogg] There is a restriction on publishers in spite of the fact that you the consumer have to go and buy the book. You are not that distinct, are you?

Lord Flowers] But CompuServe are not a publisher.

Lord Gregson

804. It is illegal to import the book. That is where the fundamental problem lies.

A. There is a sector of the Internet community whose attitude is basically the Wild West, ie let us not regulate anything as this is the destiny for society anyway. As a company we are definitely not in that category at all. We want to make sure more than anything else that we are following the law in each country, but it is very difficult at the moment.

Chairman

805. Thank you very much, Mr Gray. We shall have to leave it there. If something occurs to you afterwards that you think you forgot to tell us then we would be very glad to hear from you. But meanwhile, thank you very much for some very interesting evidence.

A. Thank you.

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[3] A new service from CompuServe targeted at the family and novice computer user.

[4] The Canadian accused of distributing anti-Semitic information into Germany from a web site in California.

Examination of Witness

DR MARY DYKSTRA-LYNCH, Professor at Dalhousie University, Halifax, Nova Scotia; and member of the National Information Highway Advisory Council of Canada, examined.

Chairman

806. Dr Dykstra-Lynch, welcome to you. Perhaps you would like to begin by introducing yourself and then telling us something about your background.

(*Dr Dykstra-Lynch*) I am on sabbatical leave in England this present year. I am a Professor in the School of Library and Information Studies in the Faculty of Management at Dalhousie University in Halifax, Nova Scotia, Canada. I am still a Member of the National Information Highway Advisory Council of Canada. I am here this morning to give evidence on what that Council has done, how it operated, what its major issues were and what some of its recommendations were. I am very pleased to be here and to represent in some ways Canada and certainly to represent the Information Highway Advisory Council. On some of the questions that I expect you will be wanting some responses to I was able to E-mail directly to Ottawa and get some very up-to-date information. You will appreciate I have not been in Canada for about five months now. It is very hard to get news from Canada in the media. I do have a pipeline into Ottawa for very up-to-date information. I was given answers to the questions directly from Ottawa within a day's time and so any other questions this morning that I may not be able to have a specific answer for I can certainly get the answer to for you from Ottawa very quickly, or I can give you the E-mail address. I have some slides to show you and I think I will do that very quickly. A lot of this will be familiar territory to you and you will probably be reassured to see that the issues in Canada are very very similar to the issues here. Then I will go on and tell you a little bit about what our recommendations were. I will not go into all 300 of them. We had over 300 recommendations to the government of Canada, but I will give you a summary of them and then go on to answer your specific questions. I have two copies of the report to leave with you and I have copies of all of my slides as well. Back in 1993 there was a National Summit on Information Policy held in Ottawa in Canada and at that point the issues were as follows: achieving equitable access; developing the human potential; maximising the economic benefits; and strengthening the infrastructure. As we progressed in this area and the Information Highway Advisory Council was established by the Department of Industry, Canada it was realised that the last two aspects, ie maximising the economic benefits and strengthening the infrastructure, really had to take place before we could ensure achieving equitable access and developing the human potential, but all of these are reflected in the work of the Information Highway Advisory Council. All of this I am sure you know. These slides are from Industry Canada. The first is on the whole environment in which we are living and working now and in which we are deliberating on these issues. It is a time of rapid technological developments, transforming how we interact and do business. There is the whole issue of convergence and restructuring of industries and institutions, hospitals, schools, libraries, etc. Then there is the issue of globalisation of markets and free trade and, lastly, the transition to an information-based economy in which all of us hope that new jobs and wealth will be based on the creation, movement and use of information. Canada was building on a very good infrastructure already. As you know, Canada is an extremely large country. It is 4,400 miles from St John's Newfoundland to Victoria, so having a communications infrastructure has been extremely important for that country with lots of rural areas being inaccessible. Many of the building blocks were already in place for Canada in terms of the Acts. There is a very high penetration of telephones, about 99 per cent and 75 per cent of cable also within Canada, which is high. A lot of satellite technology has taken place in Canada and there are lots of networks that combine the public and private sector. I will not go into what all of those are, but CANARIE (Canadian Network for Research, Industry and Education) is probably similar to SuperJANET except that CANARIE includes industry as well as education. I have just been nominated to the Board of CANARIE, and can tell you that is a very good example of private and public sector interaction and collaboration. SchoolNet is a heavily funded initiative to get the Internet into all schools in the country. There is the phenomenon of FreeNets which they have in the United States as well; these are community networks that have local corporate sponsors. Canada also has government labs and here again they are private and public research labs. There is a strong information and cultural sector. Canada has had a challenge. On the issue of job creation, will opportunities remain in Canada? What about investment, will we have the advanced communications systems to attract foreign investors? The problem of Canadian identity, as I am sure you know, is a very big problem. Will Canadians be ready to take advantage of the Super Highway? Back in 1993/94 there was already a high awareness within Canada of the information highway. 54 per cent of Canadians knew about it. That was quite a while ago now. 68 per cent of those thought it was a good idea; 76 per cent believed that business and users should pay; 59 per cent were interested in accessing it from the home. The Council was established by Minister John Manley in May 1994 with the mandate to provide advice and guidance to the government on proposed actions. I should say, we had a very high profile within government. Government looked to us for clout when dealing with matters such as legislation and initiatives. We met with several Ministers. The Minister of Industry was at nearly every one of our meetings, often the Deputy Minister as well. We met with at least five or six other Ministers of Government and also with the Prime Minister for two hours, so we had a high profile within the country. The Chairman was Dr David Johnston, former Principal of the MaGill University in Montreal. The Council had 29 members, an excellent cross-section of private sector, education, labour, consumer and other public interest groups. I was very surprised and delighted to be asked to be a member. I was one of about three

Chairman *contd.*]

academic members, the only member from the province of Nova Scotia and the only member representing the so-called information professions. Five working groups were established and then each of the working groups co-opted about five other members so we had a very high cross-section of Canadians to deal with all aspects of Information Highway development. We also did a lot of consultation. We worked within a framework of three objectives and five principles. The first objective was to create jobs through innovation and investment, to reinforce Canadian sovereignty and cultural identity and to ensure universal access at reasonable cost. Job creation is the number one priority of the government, ie job creation through construction of a modern infrastructure and continued R&D investment; job creation through the development of new products and services; efficiency gains through re-engineering of processes; cost reduction through lower priced communications services; and increased foreign investment, attracted by an advanced and competitive communications infrastructure. The second objective was within the area of Canadian sovereignty and culture. It was set up to ensure Canadian ownership and control of the telecommunications infrastructure and broadcasting system, which is extremely difficult because a lot of the bits and pieces of the technology are obviously imported. It was to support the production, exhibition and distribution and exploitation of new marketing and distribution channels and to review the adequacy of traditional supports for cultural content. It is the case in Canada that many of the children know more about George Washington than they do about Sir John A Macdonald mainly because of what comes to us from the United States.

807. That may even be true in this room!

A. It is harder living right next to them than it is across the ocean, but it is hard to get away from it in any case! There is a lesson in Canada's position within NAFTA for the UK too, as the UK endeavours to find its place within the EU. I am an American by birth so I can say this. This next slide is a humorous way of showing the 600 channels ahead and here is a little Canadian content hitchhiking along the road. It is very hard for a country like Canada, one tenth of the population of the US, not just to export and to make money on its content industry but also to interpret Canada for Canadians. It is a very big issue. The third objective is the business of universal access to essential services. We had to look at three loaded adjectives. What is universal? Does it include every single person in Canada? Is 99 per cent enough or does it have to be 100 per cent? What is essential? And then we talked about reasonable cost, what is reasonable? The mandate was to review and modernise the concept of universality, public awareness and education measures to build skills of users, including easy to use interfaces for Canadians with special needs—again, the whole matter of the consumer. On this next slide you have lorries going down the Super Highway and the little consumer being caught in the middle. I think this may be an excuse for saying that as an observer in this country, just in the short while that I have been here, it seems as though the consumer does not play as high a profile in this country as it does certainly in the United States. Canada may be somewhere in between. Consumer interests are extremely important because they are the ones that have to use this highway. There were five principles for how we would do this. Firstly, an interconnected and interoperable network of networks, ie the whole business of standards, open standards and so on came in here. Secondly, collaborative public and private sector development, a very big issue. I think Canada does this well but it obviously takes a bit of doing and a bit of know-how. Thirdly, competition in facilities, products and services. Fourthly, privacy protection and security and, lastly, lifelong learning as a key design element of the information highway. It is interesting that even though the Council was established by Industry Canada all of these aspects were included, it is not just industry. I will say a little bit on collaborative development. The idea was that the private sector will continue to build and operate the information highway; the government will define the enabling policy framework in consultation with all stakeholders; the government review of barriers to investment, innovation and electronic commerce; government as a major user of information technologies; and co-ordination among other levels of government in Canada, and with other countries. I think this was well thought out. The next issue is competition. I can give you an update on competition. The regulatory framework will be flexible and updated in an open manner. They will be open access policies and international standards. Finally, protection of intellectual property and copyright in a multi-media environment will be reviewed. Lifelong learning, just a little bit on that. This principle recognises the critical importance of lifelong learning. Well-trained workers are needed and, also, development of a national strategy for lifelong learning is important. That is essential for social as well as economic well-being. We divided ourselves into five working groups that reflected on various aspects of information highway development. The first group was the access and social impact group. The second was the Canadian content and culture group, which was chaired quite appropriately by a Canadian publisher. The third was on competitiveness and job creation, which was a heavy group, with several CEOs. The fourth was on education and learning. Finally, the fifth was on R&D, applications and market development. I know most about that group because I was a member of that one. Along the way we produced a progress report and came up with this statement. It is highly significant, I think. It says: "The Information Highway, in our view, is not so much about information as it is about communication ... It is not a cold and barren highway ... but a series of culturally rich and dynamically intersecting communities ... it is a personalised village square where people eliminate the barriers of time and distance and interact ..." I think that is an extremely important point for commerce and for social life; it all intersects there. The final report appeared in September 1995 and looks like this, that is its citation. I have only bought you two English copies but it is available in French as well, and it is also available on three different locations on the Internet and this Council's

Chairman *contd.*]

secretariat has an E-mail address. So, this is a little bit from the report itself from the executive summary to give you some idea of what the recommendations involved. The first one had to do with competition and recommended fair and sustainable competition between the major carriers and also regulation to ensure an open market, a Canadian presence and a fair game. Industry must move rapidly, the whole issue of urgency. Government must move to articulate and implement a national strategy. The issue of content and culture: Canadians and their government must attach renewed priority to promoting Canadian content and culture. Use of the information highway will improve competitiveness and in the area of innovation, innovation is the key to growth and R&D in information technology is critical. We also recommended tax credits for information highway development. Canada already has quite a generous system of tax benefits. This was not viewed too favourably but we pushed it anyway so that R&D specifically targeted information highway development to get more favourable tax credits. Our recommendation in the area of access was that the information highway should be at least as accessible, affordable and relevant to Canadians as telephone and television services are today. That was what we came to on the idea of universality of access. As I say, there is a high penetration of both of those in Canada. We should also create a learning culture within the new knowledge-based society. A lot of these seem like "motherhood and apple pie", as we say, but they do reflect the consensus of the entire Council. Health and education: we focused our applications on these areas. We have a specific recommendation having to do with health care and tele-medicine and in education we have one on electronic publishing and information services, digital libraries and so on that I piloted through the Council. And then individuals must remain at the forefront of information highway development, so the issues of security and privacy must be addressed. We offered the following messages and here is the message to government: that government should foster the environment in which the private sector can be innovative and create wealth and jobs for the benefit of all Canadians. Government should address market imperfections by ensuring a prominent place for Canadian content and culture as well as equitable access both as users and providers and set an example as a model user of information and information technologies. At the time the Council was operating during this time before the final report, a whole information management operation was going on, with the aid of consultants, in all of the government departments in view of a switch to electronic information. Our message to the private sector: adapt to the new world of the Information Highway and its freedom: firms that invest in technology and people will prosper; those that do not will fail. And then messages to individual Canadians: get involved as users and determine the kind of society we want to live in and ensure that this vision is reflected. So this Council really finished its work with the delivery of the report to the Prime Minister in September. But at the end of 1995 the Honourable John Manley reconstituted the Council, extending it for a further year. We are scheduled now to meet on June 20 and 21 of this year to pursue a broad mandate aimed at promoting public awareness, facilitating partnerships with the private and public sector, innovation and acting as a sounding board for the government. This is our more restrictive mandate for the following year. In his letter the Honourable Manley also mentioned that in particular it would be useful to have the Council's continued advice as a follow-up to the recommendations that were already made. That is basically what we have done. I have your written questions and the answers from Ottawa on those if you would like me to proceed to those now. What steps has the Canadian government taken to promote the building and use of the information infrastructure? You can see what the Council has recommended but as a more up-to-date response to that the government is shortly to announce a convergence implementation plan that will allow cable distributors and telephone companies to compete in each other's core markets. That follows on a major report last year by the Canadian Radio-television and Telecommunications Commission, "Competition and Culture on Canada's Information Highway", which came out on May 19, 1995, almost exactly a year ago. One of the recommendations in this report is that there will be a public lane on the information highway and that is in the report as well, so the government is acting on this now. The government is also licensing new wireless and satellite services.

Chairman] Can we pause there a moment. Lady Hogg?

Baroness Hogg

808. I think we are coming to a point where I would very much like to ask you to sum up the very interesting presentation you have given us on the activities of the Council and the report. Can I put the question in a slightly harder way. What specific things have happened in Canada as a result of this activity of having a Council and producing a report? What has happened in terms of government activity, legislation, regulation, taxation, expenditure, international investigation that would not have happened anyway?

A. That would not have happened anyway? My! You can always say this might have happened anyway but I do not think so. I think certainly the Council provided the policy framework in which this did happen. Clearly getting the balance right between competition and regulation was a strong point. The Council was looked to for its particular recommendations on what the government was doing. If the Council said, "Yes, this is a good thing, we endorse it", it gave the government the clout to proceed with it. There was very strong opposition, as you can imagine, from the cable companies and so on for this convergence. The fact that this report came out and the Council—

809. Opening up the markets to competition was the issue?

A. That was a key issue.

810. Right, okay.

A. The whole issue of Canadian content, I am coming to that in a minute, I think that is in here as

Baroness Hogg *contd.*]

well. Issues like social policy were clearly factors that had to be taken up and the Council provided a forum for that because it was a very balanced group from all these differing areas. It was a conduit for a lot of policies taking place.

811. What were the policies?

A. Some of them are not all in place yet, but we are working towards them: the whole business of the infrastructure; the convergence implementation plan; the licensing of new wireless and satellite services, again which the Council recommended; the issuing of transitional licences for digital radio broadcasting; and the government has a task force (that is a favourite Canadian thing to do, it probably is here too) for advice on the transmission to digital television. At the same time the Council was running there was a major science and technology review taking place in Canada and a lot of our recommendations were asked for by the Secretary of State for Science and Technology so again he would have some of the clout to do some of the things he was hoping to do. So a new science and technology strategy has been put in place.

812. What does that strategy involve? Money for research? Changes in curriculum?

A. I do not know all the details of the science and technology strategy. I was not aware that it had actually been put in place myself. I have seen the final result of the review. I can find out for you and get a copy of it.

Lord Flowers

813. Can I ask what use industry makes of CANARIE?

A. I have with me a list of the projects last year that were approved from CANARIE. This was the second phase of the funding. It does not say right here how much money it was. I believe—

814. Is it a substantial use? Is it academic and industrial? Is it 50 per cent industrial or less or more?

A. In terms of actual use these were R&D projects to initiate innovative products to make the whole system easier to use. That is what CANARIE's mandate is.

Chairman

815. Does industry use CANARIE to inter-act with other parts of industry or mainly for interaction with academia?

A. The government's response to me on this question was that surveys have indicated that only a small percentage of small and medium sized enterprises use the infrastructure just yet. The government is currently reviewing a range of possible measures to encourage wider use namely by creating on the Internet the largest business information database, (called Strategico) which was recently launched by Industry Canada and it includes information on major business trends, developing markets and exporting opportunity. The lack of security was seen as one disadvantage within the government of the relative lack of use by business at this time.

816. I see.

A. But of course there are lots of dedicated highways, not the Internet *per se*. Obviously there are financial highways and lots of other ones but in terms of the Internet it is still relatively low. However, in terms of ordinary Canadians use of the Internet, there is data that suggests a very rapid growth in the latter part of the 1995. Some of it is very recent and surveys are only just beginning to pick it up. There was a study in 1996 that indicated that 44 per cent of on-line users on the Internet had only been accessing it for less than six months. That is very interesting and 43 per cent of that 44 per cent described themselves as "beginners" or "novices".

Lord Butterworth

817. To what extent is the Internet used for educational purposes actually in the schools themselves?

A. Through the School Net initiative, again I do not have all the details for you, it is quite substantial. The goal is that all schools are wired with it but at the present time it is a substantial number.

818. All schools are networked?

A. Yes, that is the goal.

Baroness Hogg

819. That is not the reality.

A. That goal has not been completed as yet but a substantial number are ready through the School Net initiative which is a funding mechanism. There have been thousands of applications to that and there is a lot of activity going on because of School Net.

Lord Flowers

820. You are a bilingual society?

A. Yes.

821. Has that faced you with any problems, in the present context I mean of course!

A. In the present context, yes. We had francophone members on the Council as well because it was a mixture of all of us. I would say that the most innovative information highway projects are taking place in Quebec. The French are extremely innovative in Canada, very creative. For instance Vidéotron, which is also in London here, is Quebec based and André Chagnon, the CEO of Vidéotron, was on the Advisory Council as well. That is doing very well in Quebec. So I would say that Vidéotron is the most advanced of all projects.

822. I was wondering whether you were a rather large microcosm of the sort of thing we face in Europe where development of this sort of thing is affected to some extent by the different cultures of the different countries and I wondered if there are any lessons you had for us from the cultural point of view? There is a certain amount of multi-lingual usage and so on. What do you do about translation?

A. In terms of government information, Canada has always provided it in both languages and that is certainly continuing. For instance, this report is only half as big as it looks because this is the French side.

Lord Flowers *contd.*]

All government information is now available on the Internet and most government departments are providing their information on the Internet. It will all be in English and in French. In terms of individual businesses a lot of codes and commands are bilingual. These things are not difficult to do. You are either using a term that can be used in either language or you have one term and slash and then another. In Quebec you would have the French term first; in the rest of the provinces the English term first. This is just a fact of life.

823. You do not see this as a problem?

A. It is a continuing problem in Canada. It is sad to see that still being a problem in that country. It is a wonderful country and to see it being torn apart that way still is very sad because what makes Canada unique is the fact of the two cultures. Really the bilingual nature of Canada is reflected in the Internet in Canada.

Lord Haskel

824. On one of your earlier slides you had a project called UBI which is in Quebec, which is an interactive project which contains a lot of things that we are interested in such as home banking, home medicine, education. I wondered whether from that there is something we could learn of value here.

A. I did see a demonstration of that. Actually it is the company that Vidéotron grew into. It is somehow linked to the Group Vidéotron and André Chagnon did give us a demonstration of it. I think the very same system is operational here in London, is it not?

825. It is not as advanced here.

A. I was not aware of that. Apparently it is working quite well. You can order fried chicken and pizza and do your banking. There is a cable modem that IBM designed that goes on top of your box and there is a swipe card. Apparently, it is popular and doing very well. I do not have any direct experience with it so I cannot tell you any more about it but, yes, it is one of the most advanced examples of that type of system in the world.

826. What I thought was particularly interesting about it was it did solve some of the problems of security because you had a printer in your own house and you had your own cards and you had a smart card on which you had money credited and you were able to carry on in a way which did not require you to give personal financial information over the Internet.

A. Right. It has video on demand as part of it as well. As I understand it, it began with 3,000 subscribers and I believe it is growing to about 6,000 in the next little while and it has been very successful. All major federal government departments and agencies now have Internet sites, which is what I was trying to say earlier, and are able to make reports and information available to Canadians in all regions in a timely fashion, which I think is a direct outcome of the Advisory Council. Also in answer to the question earlier about would this have happened anyway if the Council had not been there, I think the fact that we have been asked to continue for a further year to provide continuing advice and feedback shows that the government has found us useful. We were such a remarkably balanced group and achieved such a convergence within the group that it was a very good sounding board for the government. We had six or seven ministers come to see us.

Baroness Hogg

827. The most important effect I have taken out of what you have told us, and please correct me if I am wrong, is that you gave the government encouragement or the justification to proceed with opening up the industry to greater competition.

A. That was as far as the infrastructure is concerned. As far as content is concerned, we made very specific recommendations such as in the area of copyright for example, and there has just been an amendment to the Copyright Act that incorporates some of what we recommended in the Council.

828. And what was the essence of that?

A. I brought a slide along about that. Some of the very contentious issues had to do with browsing and fair dealing. They were extremely contentious. The fair dealing recommendation has now been included as an amendment to the Copyright Act, ie "the section in the Canadian Copyright Act on fair dealing should be clarified. Specific criteria and guidelines as to the scope of the fair dealing exception for education and libraries should be provided, including explicit clarification that fair dealing applies to the making of an electronic copy." To my knowledge what I have seen from the new copyright legislation that is available on the Internet is that that particular recommendation has been incorporated in the new copyright amendment. Browsing became a more difficult issue, almost as big as the competition one for the infrastructure people. It raised some very strong feeling because there have been some court cases in the United States, and I believe one in the United Kingdom, where it was determined that looking at a document, pulling it up on your screen in order to look at it like you would pick up a newspaper and look at it, is considered an act of reproduction; this has tremendous ramifications for what we all regard as a right to browse before we photocopy or purchase or anything else. If pulling something up on the screen gets into the area of possible copyright infringement, even if you decide that you do not want it, it is very frightening. So we did try to come up with a definition of browsing. We formed a bridging committee of which I was chair. It was difficult to define browsing and come to consensus because writers and producers, on the other hand, are equally worried that once their material is on the Internet it is gone and everyone is going to copy them *ad nauseam* without them having payment for it.

Lord Craig of Radley

829. I want to take you a little further on the question of universality of access because we are talking about a different type of capital cost for the telephone compared to the PC and the modem. I wonder how far you had taken the concept of universality not just in wiring up the individual but in

Lord Craig of Radley *contd.*]

providing or expecting them to provide for themselves the hardware to go with that service.

A. First of all, it does not necessarily have to be individual access. There is a very strong public library tradition in Canada where there are already terminals in most of them with Internet access so people who use the public library can go in and use the Internet. That ties in with the whole Freenet initiative which is really a public library initiative in some ways, although it is obviously bigger than that, where it is a kind of community information bulletin board, social inter-action type of thing, where people can pay a very nominal membership sum. The Freenets are sponsored by particular organisations and industries within a particular community. They are all community-based grassroots efforts. An E-mail address is included with your membership. There is a lot of that within Canada. Again, people may not have their own PC and modem but if they have a Freenet address and they go to their public library they have free access. With the schools having access, there are recommendations for lower educational rates, lower rates for health care transactions, etc. Furthermore a lot of this eventually may not take place through a PC and a modem. I see a lot of it taking place increasingly through a computerised telephone and I have already seen telephones with computer screens on for banking (you probably have too) or through television such as Vidéotron and UBI where your television becomes inter-active. It may not require the addition of another appliance but a little bit of an upgrade to an appliance you already have. And, as I said, 75 per cent of Canadians have cable television now.

Chairman

830. Can you say a quick word about the attitude to the publication of let us call it "undesirable material".

A. The Canadian government has taken the position that material published on the Internet should be treated in the same fashion as material published in the traditional media. The government is currently reviewing the application of the existing legislation but prosecutions have already been launched against individuals under the criminal code for pornography and under the Human Rights Act for hate literature. It is being treated as anything in the regular media would be treated. To date there have been no legal actions taken in Canada against Internet service providers or access providers although they enjoy no specific immunity or exemption from civil or criminal liability. While the federal government has the responsibility for the criminal code, its enforcement is the responsibility of the provinces. Nevertheless, the government is currently reviewing law enforcement powers to ensure that criminal abuse and misuse of computer networks can be investigated. That is the answer I received from Ottawa yesterday.

Chairman] Thank you very much indeed, Dr Dykstra-Lynch. That was very helpful indeed.

Letter from Professor Mary Dykstra-Lynch, Dalhousie University, Halifax, Nova Scotia, Canada

As luck would have it, the Canadian government formally announced yesterday its response to the Information Highway Advisory Council—just two days after Tuesday's session. The information reached me yesterday by fax, and I participated in a teleconference later in the day. Because it will go a long way toward answering some of the questions presented to me at the session. I would be grateful if you would pass along the enclosed to Lord Phillips and the Sub-Committee members as an addendum to my evidence. Thank you so much! If you would like details from the documentation to follow (under the signature, I understand, of seven cabinet ministers) please let me know.

24 May 1996

Industry Canada News Release

MANLEY RELEASES INFO HIGHWAY REPORT

OTTAWA, May 23 1996—The federal government put an "At Work" sign up on the Information Highway today, indicating in a document released by Industry Minister John Manley that the Information Highway is a work in progress.

> "Much has been accomplished within and by government and in the private sector already," said Mr Manley. "But we must continue to move forward decisively to capitalize on the potential for economic growth and job creation held by the Information Highway."

Building the Information Society: Moving Canada into the 21st Century outlines government-wide actions to help Canada take its place in an increasingly information-based and knowledge-driven global economy. It is both a progress report on Canada's transition to an information society and the government's response to the recommendations put forward by the Information Highway Advisory Council (IHAC) in its September 1995 report. It describes the main thrusts for government action, with an overview of programs and activities that are already underway and milestones that have been met. (A Highlights document is attached.)

"I thank the members of IHAC for their efforts and wise counsel over the past two years. Since much work remains to be done, I have invited the members to serve for a further 12 months," added Mr Manley. "I look forward to working with them to ensure that the Information Highway leads to a bright future for Canada and Canadians." (A backgrounder on the Information Highway Advisory Council is attached.)

CANADA MOVES AHEAD ON THE INFORMATION HIGHWAY

On May 23 1996, the Minister of Industry released *Building the Information Society: Moving Canada into the 21st Century,* which outlines the steps the federal government is taking to ensure Canadians can realize the benefits of the enormous advances in information technology that are occurring here and around the world.

Canada has long been a world leader in the development and use of communications and information technology, and the document illustrates the government commitment's to keeping Canada at the forefront in the global transformation toward a knowledge based economy. This commitment first took shape in the 1994 Speech from the Throne which lead to the establishment of the Information Highway Advisory Council (IHAC) in March 1994. Appointed by the Minister of Industry, the Council consisted of 29 distinguished Canadians representative of a wide range of organizations and interests involved in the development and use of information technology and addressed a broad range of issues dealing with the economic, social and cultural impacts of advanced communications and information technologies.

Building the Information Society: Moving Canada into the 21st Century is a response to the Council's Final Report, issued in September 1995, which contained close to 300 recommendations calling for action by the federal government, in partnership with the provinces and the private sector.

In addition to describing actions taken to date, *Building the Information Society* presents the government's agenda for dealing with critical issues facing Canada as the Information Highway becomes a day-to-day reality for all Canadians. The government's efforts concentrate on four important tasks.

The first is to create a policy and regulatory environment which encourages industry to build Canada's Information Highway. For example, over the past two years the Ministry of Industry has authorized Canadian industry to introduce a broad range of new communications services, including advanced mobile services based on satellite and other "wireless" technologies. As well, the government has announced a new science and technology policy for Canada which will strengthen the private sector's research and development effort related to the Information Highway.

As part of its Information Highway strategy, the government is also moving to establish the rules permitting increased competition between the telephone and cable companies. It has harmonized the Canadian ownership requirements for telecommunications and broadcasting companies, and in the near future, it will be announcing a comprehensive policy on the "convergence" of the two industries to allow them to offer competing services in local markets. The aim of these and other initiatives is to stimulate investment and technological innovation and to create more choices for consumers.

Increasing Canadian Content on the Information Highway will be another area receiving priority attention. The government remains fully committed to the further development of our content and information industries. The Ministers of Canadian Heritage and Industry will soon put in place strategies to stimulate the development of Canadian content industries and to ensure Canadians can choose Canadian material from among the wealth of material on the Information Highway. Already, the National Library of Canada, through its *Access AMICUS* services, allows Canadian libraries and researchers to search electronically through millions of bibliographic records. The government plans to continue the process of digitizing the large collections of public cultural institutions such as libraries, museums and galleries to eventually make them available to Canadians across the country. These types of initiatives will strengthen our ongoing national cultural dialogue and create economic growth and jobs.

A central element of the government's overall strategy is to ensure that the Information Highway produces tangible economic and social benefits for all Canadians. Many of the areas where such benefits are now available are described in *Building the Information Society.* For example, Industry Canada has established *Strategis*, Canada's largest business Web site. *Strategis* contains 6 different information categories tailored to meet the needs of business and is available on-line. Industry Canada's *Student Connection Program*, announced in the February 1996 Budget, will subsidize the wages of senior college and university students hired to train managers of 50,000 SMEs in applications on the Information Highway. To address concerns about content on the Information Highway, the government is also reviewing law enforcement powers to ensure that the misuse of computer networks can be investigated these types of measures will help all Canadians participate fully in the Information Highway.

The government is also fully committed to getting government right through the use of information technologies in government operations and for service delivery to the public. The provision of services electronically can bring about a qualitative improvement in responsiveness and accessibility for citizens, and new information technologies also promises to make government more affordable and allow it to do more for less. The many innovative applications of IT in government that are detailed in *Building an Information Society* are helping to turn it into a model user of information technology and a catalyst for Information Highway development across Canada.

Building the Information Society reports on the progress being made by government to date and lays out some of the steps that must be taken in the future to build a knowledge-based society in Canada. Further announcements are expected from individual federal government departments and Ministers over the coming months. This all forms part of an overall plan to maintain Canada's world leadership in this domain.

For copies of *Building the Information Society: Moving Canada into the 21st Century,* you can contact the Information Highway Advisory Council, 300 Slater Street, Ottawa K1A 0C8.

HIGHLIGHTS

Since 1993, the Government has worked to put in place the elements necessary for sustained economic growth and job creation.

The Government's commitment to jobs and growth was reinforced in both the Speech from the Throne and the Budget, which outlined priorities for investing in our future in three strategic areas: creating better ways to get young Canadians into the job market; expanding our efforts to increase international trade; and accelerating the development and use of technology.

At the heart of the jobs and growth agenda is the information highway, which advances all three priorities. The Government is working to ensure that Canada benefits fully from the development of the information highway.

Building the Information Society: Moving Canada into the 21st Century outlines government-wide actions aimed at moving Canada closer to becoming an information society and knowledge-based economy.

The Minister of Industry and other key federal ministers, the Minister of Human Resource Development, the Minister of Health, the Minister of Canadian Heritage, the Minister of Public Works and Government Services, the President of Treasury Board and the Minister of Justice, have agreed to a series of initiatives and milestones for information highway development in Canada.

This joint plan reviews a number of initiatives already underway, and states the government's agenda and intentions in dealing with the critical social and economic issues that underlie the transition to an information society. It also responds to the recommendations put forward by the Information Highway Advisory Council in its September 1995 Report.

The document describes four main thrusts for government action and identifies lead Ministers for specific initiatives. It also provides an overview of information highway related programs and activities that are already underway and milestones that have been met. Government is moving forward in the following areas:

Building Canada's Information Highway

- Announcing a convergence implementation policy that will allow telephone companies and cable distributors to fully compete in providing communications and information services.
- Providing Canadian consumers and businesses with increased choices of providers and services, namely by licensing providers of new generation wireless services, such as Personal Communications Services (PCS) and Local Multipoint Communications Systems (LMCS).
- Issuing the first transitional licences for high quality interference free digital radio. Launching a public process to develop a long term policy approach for digital radio broadcasting in Canada.
- Taking measures to encourage Canadian industry to adopt open international standards for Canada's communications infrastructure.

Increasing Canadian content

- Developing a comprehensive strategy for Canadian cultural content that will reflect new opportunities for economic growth and job creation as well as foster the ongoing cultural dialogue in Canada.
- Bringing forward measures to facilitate access to capital for Canadian multimedia producers.
- Developing an export development strategy for Canadian content products.
- Establishing a Task Force on Digitization to identify means of facilitating the digitization of Canadian collections to make them available to Canadians and to stimulate the development of Canadian content industries.

Realizing the Information Highway's economic and social benefits

- Developing a national access strategy involving policy, regulatory and other measures to ensure affordable access by all Canadians to essential communications services.
- Bringing forward, in partnership with business and other stakeholders, measures to accelerate the conversion to electronic commerce in Canada.
- Launching information and communications technology initiatives to support natural resource development and environmental protection.
- Reviewing the Canada Labour Code to ensure that Canadian workers continue to enjoy appropriate protection in the emerging information highway workplace.
- Developing, in co-operation with provincial and territorial governments, and other stakeholders, a legislative framework for the protection of personal data.

Getting Government Right

- Taking the required steps to ensure that electronic commerce becomes the preferred means for the federal government to conduct its business.
- Introducing a common electronic infrastructure within federal government departments and agencies to permit seamless public access to government services and programs.
- Implementing government-wide security services such as key management and electronic authorization and identification.
- Developing, in co-operation with United States agencies, intelligent transportation border crossing systems to accelerate customs and immigration processing at border stations.

For a copy of *Building the Information Society: Moving Canada into the 21st Century,* please contact the Information Highway Advisory Council, 300 Slater Street, Ottawa, K1A 0C8 (613) 990-4268.

The document is also available on the Internet: http://info.ic.gc.ca/info-highway/ih.html

TUESDAY 4 JUNE 1996

Present:

Butterworth, L
Craig of Radley, L
Flowers, L
Gregson, L
Hogg, B
Hollick, L
Phillips of Ellesmere, L (Chairman)

Letter from QVC

Thank you for inviting me to appear before the Select Committee on Science and Technology. As we discussed the focus will be on commerce and more particularly retailing.

I will be sharing with the Committee information and views concerning what services are currently being provided and what services may evolve in the future. For background information QVC is the largest electronic retailer in the United States with an annual turnover of $1.8 billion (approximately £1.2 billion). It reaches 50 million homes in the US and 10 million customers have purchased product from QVC. QVC opened in Britain in October 1993 and currently reaches over five million homes. Its turnover this year will be in the £60 to £70 million range. QVC has sold product to over 300,000 customers in the UK and are adding over 25,000 new customers a month.

I enclose an outline that I would hope serves as a discussion document for the committee.

Mark Suckle
Chief Executive Officer

24 May 1996

Memorandum by QVC The Shopping Channel

ELECTRONIC RETAILING

WHAT SERVICES ARE BEING PROVIDED, THE CONTEXT, THE FUTURE

1. *Electronic Retailing*
   - What services are being provided
   - the context
   - the future

2. *Home Shopping . . . What is it?*
   - Bring the Shop to the customer
   - At the customer's convenience not the store's
   - The changing market

3. *Home Shopping . . . why is it?*
   - Changes in working patterns
   - More multiple earning households
   - Less opportunity for conventional shopping
   - Compares with Sunday opening and late night stores
   - Moving towards customer centered trading rather than cost centered trading

4. *Home Shopping . . . Catalogues*
   - Wide range of merchandise
   - High buying power
   - Paper, print and pictures

- Revised a few times a year
- Trend to long deliveries (28 days)
- Many more middle and upmarket players (Racing Green, Lands End)

5. *Television shopping . . . another catalogue?*

- wide range of merchandise continually changing (300 new products a week)
- a true real time customer led retailer
- only possible through strategic use of technology
- Dynamic product demonstation
- Real time stock Order Entry and Phone system controls

6. *QVC A few facts for the record*

- In the US $1,8 Billion business (1995)
    - 50 million homes
    - alliances with Microsoft and others
    - owned by Comcast and TCI
- In the UK £40 million in 1995 (2 years old)
    - 5 million homes
    - owned by QVC Inc and BSkyB
    - currently re-investing in excess of 30 per cent of turnover in high technology projects

7. *New Technology Fact or Fantasy*

- The Convergent Technologies
    - Television
    - Telephone
    - Computer
- How convergent and when?

8. *New Technology*

- Internet
- Cable and satellite broadband data transfer
- Hybrid systems
- Interactive CD
- All technically feasible but commercially?

9. *New Technology*

- What of the customer?
    - The customer buys product not technology
    - The customer ultimately pays the bills
    - The customer must feel comfortable with the systems
- What are the two most common electronic items in the home?
    - The TV set and the Telephone

10. *The present as the future*

- Leading the customer through the technical journey
- Interactive Voice Response via telephone in the UK
- Next logical step to include the screen

  - Interactive Text
- Still using familiar systems

11. *Rules and Regulations*

- TV Station or Retailer?
- Television
  - ITC Licence
  - Broadcasting without Frontiers (EU DG10)
  - Advertising code
- Retailing
  - Trading Standards
  - Product Liability
  - Distance trading group

12. *Rules and Regulations*

- Copyright
- Artwork and music
  - broadcast rights vs retail rights
  - who is the winner?
- Licensed products (Star Trek etc.)
  - agents and wholesalers
  - Territories

13. *What if....Conventional Shopping*

- The Town Centre and Shopping Mall
  - increase in choice
  - increase in convenience
  - potential reduction in traffic and effects
  - EC directorate for transport studies
- Will Home Shopping kill off the Town Centre?

14. *What if....Employment*

- Expansion of choice in a customer led environment means
  - Concentrate on service rather than always on cost
  - Creates jobs
- QVC UK
  - Currently 230 direct staff 400 indirect
  - Creating 1,100 direct jobs this year in Merseyside

15. *Key Issues....summary*

- Growth of choice service led
- Use of technology where appropriate
- Customers buy product not Technology
- Regulatory issues "Don't fit the rules"
- Copyright Issues "Don't fit the rules"
- Creates a different kind of job
- "Green" credentials

Examination of witnesses

MR MARK SUCKLE, Chief Executive, and MR RICHARD BURRELL, Director of Operations, QVC, called in and examined.

Chairman

831. Good morning, Mr Suckle and Mr Burrell, and welcome to the Sub-Committee. If you would like to introduce yourselves and then make some kind of introductory statement which you think might help us, please go ahead.

(*Mr Suckle*) Thank you very much, my Lord Chairman. I am Mark Suckle and I am the Chief Executive Officer of QVC in Britain. QVC, just to declare an interest, if I may, is 20 per cent owned by Sky and 80 per cent owned by QVC Inc. in the United States. QVC Inc. in the United States is the largest electronic retailer in the world. It had a turnover last year of around $1.6 billion and reaches about 55 million homes in the United States. QVC began broadcasting here in October 1993 and currently reaches about 5.3 million homes and it has a turnover of more than £50 million.

(*Mr Burrell*) I am Richard Burrell and I am Director of Engineering for QVC in the UK. The remarks I would like to make really are to set the scene of where we view the technology in our market. This may sound strange coming from somebody who is a technologist, but QVC is first and foremost a retailer of goods to a mass consumer market. It is not a computer software house and it is not a computer company of any kind at all, although it makes extensive use of computer technology. It is not a conventional broadcaster, although it makes extensive use of broadcasting, in this case satellite and cable broadcasting. We are very much aware that our customers, the people out there in the UK and southern Ireland, buy goods from us, not the technology by which we operate. Indeed if the technology ever gets in the way, then the goods will not sell, the service will not be provided and the business will not work. It is, therefore, essential that we use technology that the consumer has available and is comfortable with and in QVC's case at the moment, with the present state of technology, that is the telephone and the remote control television set with Teletext. Our entire approach to the use of technology and the Information Superhighway or Internet, and all the many other names that the subject has, and on-line transactions of any kind is based on this premise that we are customer-led and that shapes our entire attitude to the technology and its uses.

832. So could you tell us how you expect the UK market to develop, using this technology, and whether you have ideas about moving on to different technology?

(*Mr Suckle*) You probably have already been told that there are some 22 million TV households and by the year 2000 there will be about 23 million TV households. DTH and cable penetration will go from 5.5 per cent in 1990 to 39 per cent in the year 2000 and in the year 2000 it is forecast that there will be over 9 million homes connected up to cable and satellite, about half and half, and by the year 2000 there will be 27 million residential telephone lines and it is forecast that over 4.5 million will be connected to cable and telephones. As a retailer, we tend to think of our customers first or we try always to think of our customers first. Here I am, a customer. I want to buy something for my garden. Most people by far will go to a shop-retailing format, a garden centre, a do-it-yourself shop, Woolworth's, but a minority, a substantial minority will use traditional home shopping, mail order, direct response, catalogue retailing, whatever you would like to call it. One of my favourite catalogues is *Bressingham Gardens* and another one called *Traditional Garden Supply*. It is a wonderful thing to look through. I can see six or eight cover illustrations, I can snuggle up in bed with it, I can turn the corner down, circle it, I can call most of these firms 24 hours a day, seven days a week if I want to and at 11.30 on a Saturday evening, I can call and place my order. I can also access a catalogue on-line on the Internet. I can browse it and, if I am patient, I can see an illustration of the product and you know about drumming your fingers, waiting for the illustration to come along. Of course I cannot turn down the corner and it is not very nice to snuggle up in bed with a monitor. There are certain things that a computer can do that the catalogue cannot quite do. It can do a search function, so there is an advantage there. My garden is in the Cotswolds and I have trees around it, so I am looking for plants that like half shade and will grow on a limestone soil, so it is possible that the catalogue on the air, on-line, will be able to offer me a selection of just the right plants for that, something that this catalogue might not be able to do so easily. However, I would like to show you some technology right now which is being used by thousands of people every day. If I may say so, one of the things about both this catalogue and the one that is on-line is that is two-dimensional, it is static, and our feeling is that as long as on-line is competing with a printed catalogue, it is not going to be able to offer very much that is interesting and the key for on-line is to be able to offer full-motion video and audio. (*There then followed a video presentation*). I am going to show you one product that is offered here and how thousands of people order it interactively right now using a telephone and the television. We are going to skip the introduction for this and going to go right to the first product that is available. I am going to order this product by using the telephone. There is a hands-free 'phone here. (*There then followed a telephone demonstration*). The system is now searching the database and I am going to hang it up there, but I have just ordered a growbag through my account on the telephone and not only have I ordered it, but I want you to know that thousands of people are doing this every day right now on QVC. They are using the telephone system and the television system to be able to order a product. I was very interested to see an article about how Selfridges were very pleased with the results of being on the Internet and they were getting £900 a week in turnover from their CompuServe page. This is something that is being used by thousands of people and producing hundreds and thousands of pounds of sales each week right now by using the telephone and using a television. We think that what will evolve will evolve

Chairman *contd.*]

from what people feel comfortable with rather than necessarily from a PC and a modem.

Lord Gregson

833. You did say in your introduction that there is interaction also with Teletext or whatever the equivalent is. What is the interaction with Teletext in that circumstance?

(*Mr Suckle*) Because we cannot get cable and satellite right now, I cannot show you that, but we also have pages of information about products on our Teletext page. We have our own mall so that people can look at products and order the product from Teletext.

834. And study them.

(*Mr Suckle*) We think that the most exciting opportunities will be the ability for there to be full-motion video and audio. If you think of some of the other groups that have come to see you, if you were a company like Ford Motor and you wanted to show every one of your garages how to reset the timer on the system, you would be able to do a training video which you would be able to call up any time on demand on every replacement, on every part on a Ford car. Obviously the advantages in health care and in education are enormous once you can bring down full-motion video and audio in real time. Right now the Internet cannot do that. It is very, very close to being able to do that.

Lord Flowers

835. I do not mean this to sound rude, but what precisely are you trying to tell us, that you can do better than Internet can? I have no doubt that you can at the present time, but, if I may put this to you, before very long we shall have a box on top of the telly that allows us to receive the Internet on the television set, so what then will be the position of QVC operating as it does now?

(*Mr Suckle*) I do agree. In fact I do believe that what we are trying to say is that it will evolve from the television more likely than it will from a computer. It will be something that is an extension of your television that will allow you to access the Internet.

836. The television will have a computer built into it or built on top of it.

(*Mr Suckle*) Yes, or built on top of it.

837. So is there any point that you are making?

(*Mr Suckle*) The point I am making is that people will feel most comfortable with something that is not a computer. They will feel most comfortable with something that evolves from the television rather than from the computer. Once there is a large audience of people who will be able to have access to the Internet, and that will be some time from now, and they will be able to download full-motion video, then retailing will be able to take advantage of on-line and two things will probably affect that. On the horizon in the next two years are cable modems which should allow homes to be able to download information about 100 times faster than they can currently download information and it should make for the first time full-motion video available easily because it will provide the band width that is necessary for you to have full-motion video and until there is full-motion video, the Internet will be no more interesting and perhaps less enjoyable to read than this catalogue.

(*Mr Burrell*) I think what we are trying to put across here is that this is a concept of screen shopping and it does not actually matter if it is a television screen or a computer screen, but what you are presenting to your potential customer is the goods that they may or may not wish to purchase.

838. You are just putting emphasis on the video really?

(*Mr Burrell*) Really we are putting emphasis on how you present those goods. What we are saying is that there is a better service to be provided to the consumer by a full presentation of what the goods do rather than what is currently available on Internet shopping. That is not to say that in the future as this develops with video compression algorithms allowing more and more material to be squeezed down smaller band width and the higher band width spreading out into the home that that will not be a development problem. That will obviously allow the inclusion of full-motion video proper demonstrations, as we have just been seeing, not in a linear format, such as we are doing at the moment where you have got to know where the gardening show is in order to be able to get it, but in a more on-demand format. I think that is really what we are trying to get over, that we are trying to take a picture of what now the consumer tries to see and what the consumer wants to see.

Chairman

839. The other side of your picture is that the ordering and the payments are done by telephone which is something people are familiar with in every day life.

(*Mr Burrell*) Correct.

(*Mr Suckle*) And feel is secure. Most people in this country have no compunction about giving their credit card information over the telephone.

Lord Craig of Radley

840. You described how the picture and the presentation to the customer is going to improve in all sorts of ways because of increased band width and so on. It appears at the moment to me to be a very slow method of actually getting across to the supplier what you want. You have got to press a number of keys and it is an iterative process. Are there any ideas there for improving that aspect because my belief is that the customer will find that the most irritating piece of the home shopping experience. I wondered what your views or ideas about improving that might be.

(*Mr Suckle*) Well, if on your set-top box you can just press a button which can order something, obviously it is going to be a lot easier and many people feel that that will increase response. When they look at pay-per-view in the United States, when they have to call in on the telephone and order it versus when they press a button, the uptake of it is

Lord Craig of Radley *contd.*]

three times when they just have to press a button than when they have to call up on the telephone.

(*Mr Burrell*) Certainly with the cable infrastructure that is coming very, very soon, looking at companies such as Videotron with their backpath system, that would become a reality in the near future. There have been a number of different projects that have gone through and failed, I have to say, to produce the purchasing version of that and in fact we in Britain are far more adept at using one of these to negotiate purchasing with than a lot of other nations because of our high use of Teletext. We are used to using this as a navigator, not just as a channel surfer, but actually using page numbers to page through and in fact Teletext was one of the aborted products that tried to put a "buy" button in. There was a project funded by Philips in Austria and Germany which wanted to put a "yes" button in the next family of Teletext chips which then dialled back through the PSDN network to make a purchase. Unfortunately it reached its first feasibility stage and they could not get the cost of this down low enough to get it out into the market. It will come and I think pay-per-view may well be one of the leading applications that gets the price of this down far enough to get it out into the market because then if you can do that, you have not got the sit-up-and-beg version of buying from the computer where you have got to type it all in, but you can sit back and be comfortable in your armchair and just do it like that. It will ask you to confirm and you will have to have an account set up first, but with most catalogue operations you do anyway.

Lord Hollick

841. You have emphasised the attraction of full-motion video to viewers and I can see it is an appealing feature, but you described earlier how you could be able to use a computer to help you search for the precise plants that flourish in a certain environment, and that is only available if you have a computer and you are on-line in effect. Has your parent company in the United States migrated this service into an on-line world with full-motion video? For instance, are you participating in the Orlando experiment that Warner's are doing and what has been the result of any experimentation that you do in that area?

(*Mr Suckle*) We have a QVC home page which has information and two-dimensional illustrations. I have a tape if you are interested, but it is like almost any other Internet retailer now where you dial up or call our home page and then you wait until the illustrations download and you drum your fingers for a little bit, the hour glass is there and then the illustrations are there. It is two-dimensional. There is a search function that we have available so if you wanted to buy a coffee maker that also had a cappuccino function as part of it and you wanted it to be for ten cups or more, you could essentially specify that and search for that. We have not been doing any experiments so far with the Orlando experiment or any of the other ones having to do with full-motion video. However, there are a number of experiments going on right now having to do with cable modems and when cable modems become introduced and the band width and the ability for you to be able to provide the data down the line and at a very, very much faster rate is when we will be looking to do those experiments or those trials. We are, as I said, retailers at heart and we are looking for not any particular way of reaching people, but we are looking for an audience and a large audience at that.

Chairman

842. The penetration in the United States is clearly much greater. Is that dependent on or a function of how long you have been operating in the United States or are there additional features, such as the greater use of cable modems or cable television in the United States than in the UK?

(*Mr Suckle*) Well, our penetration to our audience on a per-home basis in the United States versus the UK is actually the same as QVC was in its second year of operation, but there are only 5 million homes which are connected up to cable and there were many, many more homes that were connected up to cable seven years ago when QVC was in its second or third year, so the inhibiting factor is the number of the homes that we can reach, but otherwise the model is very, very similar and we are doing about the same per home as QVC did in its second or third year and the home shopping market in the United States right now is dominated by two players, QVC and Home Shopping Network, and they do essentially about 3 billion in turnover and they reach somewhere around 60 million homes, so one way you can look at it is that the industry, this kind of television shopping is doing around $50 for every home that it reaches. If by the turn of the century we have 10 million homes which are connected up to cable and satellite, then our industry will be of the 300 million scale, which is a sizeable business, but it is not really huge compared to retailing and we are the most successful in this area so far.

Baroness Hogg

843. The figures you gave us at the beginning indicate that at the moment in the UK you are doing something like $15 per home, so you would expect a relatively modest growth over the next three or four years in sales per home and the main drive you would expect to come from penetration. Have I got the balance right?

(*Mr Suckle*) I think that we would consider it to be a substantial increase in penetration, perhaps 25 per cent a year, in the sense of growth on each person we have, but of course cable and satellite is growing by approximately a million a year, so if you start with 5 million, there is another 20 per cent increase there in its first year. As the base gets bigger, that million becomes a somewhat smaller percentage each year.

844. But do you expect yourselves to work up a learning curve as to how to use these techniques to sell goods because it does not seem, even if you get it up to $50 per home, that that is very high and, as you say, you are the most successful? What is the inhibition on sales growth here, do you think?

Baroness Hogg *contd.*]

(*Mr Suckle*) First of all, if we look at the US model, QVC reaches around, I would say, 50 million homes and they have in ten years just had their ten millionth customer, so 80 per cent of the audience have never bought from QVC in ten years and there are a lot of people who do not shop by mail order. Now, we know that the demographic changes that are happening will make mail order more and more attractive. The growth in mail order in the United States and to a certain extent here has been in relationship to the growth in working women. Time poverty is much more of a consideration nowadays. In addition to that, we know that there are more people who are less mobile, older people, women with babies who are at home, so the demographic changes that are taking place will make mail order more attractive to more people and so it should have a large penetration. However, anybody who thinks that this or QVC is going to be the death of traditional high street retailing is kidding themselves. It will have a very, very small effect on high street retailing.

845. I very much share your enthusiasm for the *Bressingham* catalogue and it is certainly a lot more fun to surf than the Internet. You have given us some very interesting comparisons between the United States and the United Kingdom and I wonder if you could widen that to the rest of Europe and tell us how we compare in the rest of the telesales business to other European countries.

(*Mr Suckle*) Britain is in a fantastic position right now because all the expertise in Europe for the most part is here because *Television Without Frontiers*, the EC Regulation, essentially forbids television shopping in most countries. The ITC in this country took a very advanced point of view and said that *Television Without Frontiers* when it was constructed really did not take into account a catalogue on the air, a channel which was 100 per cent selling product to customers, and we do not take any advertising, you cannot buy your way on to QVC and, therefore, varied the arrangements in Britain, but for the most part no other European country has varied those arrangements. So in most countries there is perhaps an hour a day which is allowed under *Television Without Frontiers* or in France they have 22 minutes a day where they run a television shopping service on terrestrial television so it reaches 18 million homes. For the most part the expertise which is being developed is being developed here. If *Television Without Frontiers* Version 2, which is making its way, a very, very difficult way, through the European Commission and the European Parliament recognises that television shopping is a different beast and should be treated as something differently, when that happens, it will be a great opportunity for British television shopping to go into Europe and to take advantage of its expertise and for it to grow. QVC, for example, is already in discussions with getting a licence in Germany in order to be able to do that and if we do have a licence in Germany, most of the expertise will come from London.

Chairman

846. You made an interesting comment, to me at least, about it not having a great effect on high street shopping and the illustration that you gave us was really for a piece of, what shall I call it, speciality equipment for garden enthusiasts. How do you see that developing? Is it going to remain the sort of thing where you browse through a catalogue and see something that catches your eye as a possible gift to Aunt Mary or an extra luxury item for your home or do you not really see it spreading into the weekly order for cornflakes and potatoes and so on as from a supermarket? That is the sort of shopping that a good many working women whom you mentioned need to get under control, for example.

(*Mr Suckle*) I understand that. The problem with that industry and several other ones is that the margins that are available in the supermarket trade are so small that they will not, as we see it, allow them to be able to run this business via the Internet. It is based on having a big shed and having a huge amount of product which is done on a self-service basis and for someone to be able to go and pick your order and to deliver it to you will be a costly exercise and unless you are prepared to pay more for it than what you pay in the supermarket, which is a very, very competitive environment right now, we do not see how it is going to work. If I can use this catalogue again, if I am interested in buying this cold frame here, it might be that I would want to make sure that I knew how to put it together and, therefore, I go back to either on-line or QVC. When full-motion video is available, we will be able to show people not only the product, but how to put it together and then how to use it, what is the best way to do it, and that is when it will be more interesting to the customer than this catalogue.

Lord Flowers

847. What you do not show, and I do not see quite how you can show it, is the quality. My wife and I used to indulge in this kind of thing quite a bit at one time, but we discovered that the quality of the products was totally unpredictable, so we have essentially given it up because we had to send so many things back and the arguments we got into then were horrendous, but never mind. I do not see how you can describe the quality. If you could, I believe that you and mail order firms might very well do better.

(*Mr Suckle*) There are a lot of people who feel they must touch and see and feel the product and that is where I was talking about the 80 per cent of people who do not buy from mail order, but there are many people also for whom the word "quality" is associated with the company that is selling the product. If Marks & Spencer got into the mail order business, would you feel comfortable about the quality of the product? At QVC we want essentially to establish a brand name which tells people that we have very, very high quality standards and should there be any problem at all, they may be able to return the product without any question with a full refund. We stand behind our products 100 per cent and we hope that over the long term more and more

Lord Flowers *contd.*]

people will spread the word and in fact this in a way refers to Baroness Hogg's question about what are the barriers to more penetration. One of them is that we need our audience to know that we have a Marks & Spencer attitude about quality and about customer service.

Lord Craig of Radley

848. The other point which the customer is very interested in here is the delivery time as well as the quality of the product. What I am not clear on is whether you believe that delivery time is an essential part of the selling position that you adopt. In other words, in order to be able to deliver quickly, you must of course have it to hand in your depot or wherever. I wondered then, taking that question a stage further, when you are looking to spreading your customer base outside the UK into Germany and so on whether you see a need to have the depots locally to the customer or whether you can meet time delivery expectations from a more central arrangement.

(*Mr Suckle*) I think instant gratification is something that everybody wants. They want to get their hands on the product as quickly as possible. We have a system so that we ship the product the next working day. We would like to get it into the customer's hands in three days and 90 per cent of the product is in the customer's hands in three days and 100 per cent in five days. Not only must it be easy for people to get the product quickly, but if there is any problem for any reason, it needs to be easy for them to return it to us. That is why we also feel that when we are in Germany we will need to have a depot in Germany not only for getting the goods out to the customer, but a place for them to return them to easily. It is quite possible that someone could set up a pan-European operation and ship the products out to customers if the freight forwarders could get fast enough, but in the end I do not think any German customer wants to have to return the product to England; they want a local address to be able to return it to. In addition to that, because our whole system is set up in real time, that is, we are taking orders second by second, minute by minute, our inventory system essentially never allows us to oversell the product and we only sell product that we have in stock. As soon as it gets out of stock, the customer is told that it is out of stock and we do not take back orders.

Baroness Hogg

849. Just to get some further idea of the profile of goods sold this way, could you give us a few more examples of what have been your highest selling products?

(*Mr Suckle*) Perhaps I am like a broken record in this, but actually the products which demonstrate very, very well, and here I am going back to this full-motion video again, so the products that demonstrate very well are the products that normally sell very well on QVC. That is why I showed you something for gardening. We have a very, very successful business in cooking and cookware and kitchenware and we can show people how to use it. We have a very successful business in cameras and electrical goods where we can demonstrate how to use the product. One of our fastest growing areas is health and beauty which is skincare, haircare and nailcare. There are many women who would not feel very comfortable going into a department store where you go into the ground floor and there are all these people trying to demonstrate the products in nailcare, haircare and skincare and they would not feel comfortable going to that, but they would feel very, very comfortable watching how to use it on the air and then ordering it from us. It has grown in the last year from being about 5 per cent of our business to being 15 per cent of our business. All of these product areas generally are helped quite a lot by us being able to demonstrate how to use them. There is one major area that does not require that and that is jewellery. We sell 9 carat gold jewellery, 14 carat gold jewellery, even 18 carat gold jewellery, so this is not inexpensive on air, but one of the great things about both on-line mail order and on the air is that you get a huge amount of information about the product, much more information than you would get if you go into a shop-retailing environment. Shops try to have point-of-sale information for you, but they cannot really tell you as much as you can get out of a catalogue or as we can show and demonstrate. Many times the staff are not around or not very well trained. Most shop retailers are very frustrated about the inability of being able to have high quality trained staff. When QVC sells gold jewellery, we are probably the only retailer around who actually tells you how many grammes of gold you are getting in the product. Go to a high street jeweller and see whether or not, if you are looking at a gold chain, you find out how many grammes of gold you are getting in this. Therefore, our customer has become very, very savvy. We have actually sophisticated the customer in their knowledge about how to buy this product and they can very, very quickly divide the number of grammes into the price and see whether or not they are paying £10 a gramme for 9 carat or £8 a gramme for 9 carat or, as the high street might be doing, paying £12 or £15 a gramme for this and they become more discerning customers because of this.

Lord Craig of Radley

850. Taking this opportunity for the customer to be interactive, that offers up opportunities for the customer to start specifying particular aspects of a product. The car is the classic one where I want it to be red and I want the windows to be electric, but there are many more products now and in your imagination and knowledge, you can probably tell us the sort of ones that you believe might fit this particular profile. Do you see it in fact as a lucrative market to explore as interactivity develops?

(*Mr Suckle*) At this point, no. We are more inclined to feel that sometimes too many choices can actually confuse a customer and what we are trying to do is provide the customer with the best product, with all of the features that they would want at the best price. Now, there is obviously room for feedback, for people to tell us what they would like

Lord Craig of Radley *contd.*]

and we are very sensitive to that. We get hundreds of letters a day suggesting products and many times we take them up. I think that there have been discussions about how on the Internet in the future you will be able to look at a blouse and then you will be able to choose the colour of it and have it modelled by having the person turn around and if you want to see what it looks like in green, you will be able to choose green and it will change. I think that with a lot of those, I am not sure how well they will actually turn out. They will be very, very expensive animations to develop. I think that there are some wonderful opportunities in full-motion video and it does not only have to be for the big guys. While I think high quality video can be produced by companies which are in the broadcasting area, I think that it is very, very easy for someone who has a product to be able to record something almost like a home video. In many ways people may find that to be more appealing because they will feel it to be more sincere. They are actually working directly with the vendor, the manufacturer. They are hearing the person who created it almost in a home video atmosphere, so I do not think that it only has to be slick professional activities that are going to be able to get on the Internet. I think that QVC, on-line and the Internet actually can provide some very exciting opportunities for small and medium-sized businesses to cut through the distribution chain and be able to reach audiences that they could not otherwise reach. If you have a product that you have invented here and that product was invented by a British plumber and if you have that product and you want to get it into Germany, you would have to find a wholesaler or a distributor and the distributor would then have to get it into the retail chain. You would probably have to put up some dollars, pounds or Deutschmarks in advertising support for it and you would probably have to provide them with stock maybe at no cost while they try to sell it on a sale or return basis. Using the Internet, on-line mail order, QVC, you would be able to cut through that and be able to reach the German customer directly and it can provide wonderful opportunities for small businesses.

Lord Gregson

851. Has your company ever done any work on looking at the cost comparisons of various methods of retailing? For instance, catalogue buying of gardening products is well known to have high costs as a basis of buying gardening products. Most people like going around garden centres and nurseries and so forth and there is a big difference in the price when you have got to add package and postage on to them. Is there any work being done on the comparative costs of this?

(*Mr Suckle*) We are for the most part a mass market retailer and, therefore, value is the most important thing. It does not necessarily have to be the lowest cost, but it has to be the best value. I think that it goes back to what I was referring to before about small businesses and medium-sized businesses. Actually the plants that you see at the garden centre are for the most part mass market plants and if you want specialised plants, you are going to have to go to a specialised garden centre and they may be few and far between in your neck of the woods, or you are going to need to order from a specialised catalogue and, therefore, particularly on the mail order and on-line, there are great opportunities for niche marketing.

852. But *Bressingham* is at the very top of the price range for plants.

(*Mr Suckle*) That is true.

853. It is not quite at the top actually and I can name another one which is at the top, but it is an expensive way of buying plants compared to going to the garden centre.

(*Mr Suckle*) It is.

854. Also you can see the quality at the garden centre and you do not buy a pig in a poke, though I am not suggesting that *Bressingham* would supply a pig in a poke, but at least you know what you are buying.

(*Mr Suckle*) It is true, but if I would like to have the silver-leafed version of the plant which is only available in a few outlets, then I will not be able to get it at the garden centre.

855. Then you write off to *Plant Finders' Guide* and you find the company which provides it at the best price.

(*Mr Burrell*) But there is your Internet navigator choosing your plants for you.

856. It is called *Plant Finders' Guide* which is published by the Royal Horticultural Society.

(*Mr Suckle*) Not only will the Internet navigator be able to provide you with the plants that you are interested in and which are right for your garden, but there are Internet navigators right now which will find you the product at the lowest price. I understand that there is an intelligent agent which is available from a company that sells CDs where if you tell them the kind of music that you like, it will recommend in the future new issues that are like the ones that you like. If you happen to be interested in opera, Italian opera, it will tell you all the new issues that are coming in of Italian opera.

Lord Hollick

857. Could I come back to the method of payment because I was very struck by your comment that people are very happy to give their credit card number over the telephone and that is also my experience, but people are very nervous about typing their credit card number into the Internet because someone could find it out and have a free ride on their credit card for a few days. At the moment you are not selling on the Internet, although I think you have a home page. Can you shed any light on this issue of paying over the Internet or would you see a hybrid system when you are able to demonstrate on the Internet where you would still see people using the telephone? I was rather struck by your suggestion that you might have an account number which you then press and it is presumably a preset account number. How do you assure the customer about the security of these systems?

Lord Hollick *contd.*]

(*Mr Suckle*) I agree with you that this is a problem with the Internet right now and I am the same in that I am not prepared to put my credit card on to the Internet, but it can be solved fairly easily in that there needs to be an encryption method that will allow you to be able to send the information. This is not like putting a man on the moon and it can be solved. It is only a question of there being a standard or standards that are agreed and then for people to feel comfortable enough to do it. You know recently there was an EC Directive about distance selling and there was a great pressure from German EC legislators that you should not be able to place an order without actually signing some document. Now, that was not agreed in the final regulations. That comes from in Germany people mainly being used to not having credit cards, but using a bank giro method in which you essentially instruct your bank and sign something to it. Now, in Germany people may in fact feel that giving their credit card over the telephone makes them nervous. In this country we do not feel any compunction about it at all. I think it is a question of reassuring people and the Internet will have to reassure them probably by an encryption system. In addition to that, if people are accessing it through a line that is like a telephone line, and I am thinking about a cable modem again, then they will feel that it is a discreet line. It is not mixed with everybody else and nobody else will be able to get my telephone line. They will think of the cable modem like a telephone line. They will be able to press that set-top box and put those numbers in as well and be able to charge it. That might be a way of going forward, either what cable modems can do for people, which are essentially a discreet line like a telephone line, or encryption.

Lord Flowers

858. You mentioned different attitudes in Germany from what they are possibly in some other countries and I know what you mean because you cannot buy gas in Germany on your credit card, for instance, or it is very difficult to. You put this down to the attitude of the people, but is it not the attitude of the banks? Is it not the banks in Germany which dislike credit cards because they take business away from them?

(*Mr Suckle*) I am not aware. It could be, but there are a lot of other banks, like Chase Manhattan and Citibank and NatWest who, if they thought there was an opportunity to be able to break through in credit cards, would go after the customer, I believe. I think that there is a very, very low penetration of credit cards in Germany right now and part of that no doubt is because it has not been pushed, but part of that is that—

859. Or because it has actually been opposed.

(*Mr Suckle*) But in the end the customer calls the tune. If there was either a demand or a demand could be stimulated for credit cards, people would take it up, but at this point there does not seem to be a demand for credit cards and the players there do not seem to feel that stimulating it will create that demand.

Chairman

860. I am afraid that time is, as always, the enemy, but perhaps I could ask you a last question. You mentioned the problem with the proposed EC Directive, *Television Without Frontiers*, but I wonder, as the first part to the question, whether you have discussed with the Department of Trade and Industry the problems that you have with that sort of Directive interfering with expanding your business Europe-wide, and, secondly, are there any other regulatory issues that you are finding bothering in the development of this market?

(*Mr Suckle*) We have been lobbying directly in Brussels as far as *Television Without Frontiers* is concerned and we have lobbied directly with English MEPs. We are rather fearful that *Television Without Frontiers* has been so hijacked by the quota question that it in fact will not get through at all, that for the first time the Parliament and the Council seem to be at such loggerheads that even a compromise agreement will not come forward. Therefore, we in the industry are now trying to see whether or not there is another way around what is essentially agreed in *Television Without Frontiers*, that is that television shopping is a separate entity, and whether or not one of the other Directorates, either Competition or Harmonisation, might be able to take this on and be able to resolve it in some kind of regulatory way rather than it going through Parliament. I think that the biggest problem going forward in Europe happens to be about intellectual property rights, copyright. It is a very, very difficult area. In the United Kingdom we have the Mechanical Copyright Society, the Performing Right Society and firms license intellectual property rights for distribution in the UK. There are ten or eleven countries in the EC and many countries outside the EC which have their own regulations about intellectual property rights and if we have the agreement with, let us say, Disney to be able to show a Mickey Mouse watch and to be able to play some Mickey Mouse music on this, we can do it in the UK because we have covered it with the Mechanical Copyright Society, the Performing Right Society and Disney, but if we try to broadcast it in the rest of Europe, there are untold contingent liabilities which we could face all the way down to in Norway where we might actually have to pay something like a penny a home for every home that could get us whether we sold the product or not. I think that this will apply to many areas of broadcasting, this whole question of intellectual property rights, and how we are going to make it through Europe when no one has ever faced this before.

861. Thank you very much, Mr Suckle and Mr Burrell. I am afraid we shall have to leave it there. Could I say two things finally. First of all, if something occurs to you which you think you might have said which would be valuable but did not for some reason say, please write to us about it or ring up the clerk. Secondly, thank you very much indeed for some very helpful evidence which fills a gap in the evidence we have received so far on this issue. Thank you very much.

(*Mr Suckle*) Thank you very much for inviting us.

Memorandum by Mercury Communications

Mercury welcomes the enquiry by Sub-Committee 1 of the Science and Technology Committtee into *Information Superhighways: Applications in Society.* It is particularly encouraging that the focus of the enquiry is on applications, since so much of the debate to date has concentrated on infrastructure.

Although there has been extensive debate on information superhighways and the information society, the UK—in common with others—remains a long way from finding answers to the questions involved. This will continue to be the case while debate focuses on infrastructure instead of applications and services. This memorandum addresses the questions raised in the letter of the Clerk to the Sub-Committee dated 19 December 1995; it will be clear that many issues remain to be resolved.

SUMMARY AND RECOMMENDATIONS

- The "information revolution" arises from convergence and digitalisation, which allow information to be more easily stored, searched, copied and transmitted.
- New technologies will allow an explosion in the choice of services available to consumers. The Government's existing policy of infrastructure competition is vital to provide the bandwidth and local loop access to support this service growth.
- Developments will be customer-driven and unpredictable. For this reason it is not possible to give definitive answers to many of the issues raised by the Sub-Committee.
- There is no such thing as "The Information Superhighway". New Communications services will continue to develop and be delivered over a range of infrastructure.
- Future policy developments must take full account of the Internet, which provides the closest current approximation to an "information superhighway". Its openness and freedom from grip of dominant interests mean that it has developed rapidly.
- It is vital that this exciting new industry remains open to all-comers, in order to secure maximum customer service and choice. It is important to avoid the type of dominance which has arisen in the UK telephony market.

QUESTIONS RAISED BY THE SUB-COMMITTEE

1. *What is the current form of the "Information Superhighway", and how is it developing (i) in the United Kingdom and (ii) worldwide? What specific problems arise from incompatible network standards and why are these incompatibilities arising?*

1.1 *The information revolution*

The information revolution underpinning the developments the Sub-Committee will consider has principally been the revolution of the digital computer. The falling cost and increasing processing power of PCs have led to their near universal adoption as a business tool, and increasing personal use. The innovation and vibrancy of the computer industry have resulted in applications unimaginable even 10 years ago. As systems become capable of handling ever larger quantities of data, and of reproducing video quality moving pictures, the incentive is to digitise even more areas of human creativity. It is the ability of digital material to be easily stored, searched, copied, manipulated and transmitted that lies at the heart of the information revolution.

There are therefore two key factors now driving the information revolution:

- increasing processing power leading to video-capable personal computers with the ability to handle digital combinations of voice, video and data-combinations known as multi-media;
- the availability of bandwidth at an affordable price, which has led to the development of digital communications enabling mass market networking.

Much has been made of the first of these developments, and many exciting and useful applications will emerge as a result. However, the second development, which builds from the first, will have the more truly fundamental impact on society and our way of life.

1.2 *The information superhighway*

The term "information superhighway" is used freely by media, politicians and others to refer to a plethora of developments in communications technologies. Debate has tended to focus on infrastructure, ignoring the fact that the real value of improved technologies derives from the services that become available to consumers.

There is no such thing as a single "information superhighway". New communications services will continue to develop, utilising a range of network technologies. The key factor offering affordable access to new services for businesses and consumers, and currently the closest approximation to an "information superhighway", is the Internet.

Future policy considerations must take full account of the Internet. It is worthwhile stating the factors which have contributed to its success. These are:

(i) Evolution of the Internet is driven by demand, not technology. Commercial services for which there is a market can rapidly become established and flourish. Many of the current key players, such as Netscape Communications, VocalTec and UUNET Technologies/Unipalm, did not exist a few years ago.

(ii) Internet-delivered services are not dependent on heavy investment in broadband infrastructure, enabling rapid speed-to-market for service providers.

(iii) The Internet is not controlled by incumbents with entrenched positions to protect. This contrasts starkly with the position in the telecoms market, where abuse of dominance is an all-too-familiar characteristic.

(iv) The Internet has an open architecture, allowing a multitude of companies to offer services. This approach ensures successful evolution of the system as a whole, even if individual applications fail.

(v) The Internet allows different systems to interconnect.

(vi) It is relatively cheap for the end-user. Services can be provided over networks which are already in existence.

Mercury does not suggest that the Internet is without problems, nor is it the last word in computer-based communications. Nevertheless, future communications networks will be heavily influenced by it. Its open, competitive model has enabled impressive advances to be made:

— The Internet can now support the transfer of voice audio and video over existing telecoms infrastructure. Real time applications, such as dialtone, audio broadcast and video conferencing highlight the potential for public telephony services to be delivered over the Internet.

— Internet technology is increasingly being used in private networks. Companies are opting for Internet technology as an alternative to proprietary networks and software because it is seen as cheaper, easier to use, compatible with external Internet investments and supports a wider range of applications. The interconnectivity between different systems on the Internet means that it is a genuinely open network.

The Internet as it exists today is delivering embryonic "information superhighway" services. Mature superhighways and associated services will develop from today's open Internet model. We are already seeing demand for the plethora of new Internet services driving the addition of incremental bandwidth to the Internet backbone, and beginning the drive demand for high speed access.

1.3 *UK and national developments*

The question seeks to separate national and worldwide developments. The Internet is no respecter of national boundaries, and it is not possible to make a meaningful geographical distinction. Technology will enable customers in any country to access services developed in any country, although clearly there will be language barriers. The common language of the Internet is English, which gives the UK an important advantage. In addition, the UK has a strong tradition in the creation of innovative content and services.

Nevertheless, it is essential to look beyond the UK and learn from experience in other countries. The Cable & Wireless Group, to which Mercury belongs, is in an excellent position to trial developments, taking account of local markets and regulatory frameworks. For example, Mercury's sister company in the Cable & Wireless Group, Hong Kong Telecom, established a new company at the end of last year to explore a range of business opportunities arising from interactive media services. The new company Telecom IMS Ltd, will develop a full range of interactive multimedia services. One of the first products is NETVIGATOR, a comprehensive dial-up Internet service for the local market.

1.4 *Compatible network standards*

There are no regulatory or official standards bodies prescribing the technical standards used to access on-line services.

Until about two years ago, on-line services grew in number based on the use of very simple terminal emulation software to access bulletin boards of all kinds. Accessing these required a certain level of computing skill.

A variety of proprietary networks also emerged which required passwords to access, again with very simple PC software, a range of information, forums and bulletin board services from a single, commercial provider. CompuServe was perhaps the first, and is certainly the most successful of these networks.

With both the bulletin board services, and the commercial networks, no attempt was made to link them together. Access to any one of them did not provide access to any other. This was partly due to differing technical approaches but also to enable the commercial networks to develop their own customer base independently. The Internet has changed this position fundamentally. Through the foresight of the US defence and academic communities an open standard network has been brought into play, with standards controlled by the participants on, now at least, a commercial basis. The standards process, whether by luck or judgement, has proved robust, flexible and well-communicated. The market—ie service providers and users—determines the success of standards developments by adopting only those which work.

1.5 *Security*

There is one issue that may provide pressure for further change and that is security. Currently concern about security is hampering the development of transaction services. Large companies, especially banks, are very unwilling to use any network, however secure, that shares any part of its infrastructure with any public network. Until this resistance is overcome, there is no prospect of large-scale transactions services over the Internet.

The position may change following the decision of Federal prosecutors in the US, after a three year enquiry, not to prosecute Philip Zimmermann for publishing on the Internet an encryption protocol known as PGP (Pretty Good Privacy). Until this judgement, all secure means of suppliers interacting with customers (such as to pass credit card numbers) were under investigation by the security authorities of the US (or its allies).

However PGP is not yet adopted. Mastercard and Visa are both working hard to develop new security systems for Internet transactions. A consortium known as CommerceNet in the US has trials running. It may be that in order for transactions to be developed as an area of business on the Internet large commercial firms or consortia will need to underwrite, technically if not commercially, the use of secure transactional systems on the Internet.

2. *What services are being provided, and (should be developed/will be required), within for example the following areas:*

(i) public information
(ii) commerce
(iii) finance
(iv) education
(v) industrial training
(vi) health

The speed with which services are being developed means that it is not possible to give a comprehensive list. The important point is that the value of communications technology will lie in fostering an environment in which there are no artficial barriers (eg of access or tariffing of delivery mechanisms) to service providers developing services to meet consumers' needs.

A number of services provided by Mercury illustrate the potential of communications technology. For example, in the field of criminal justice, Mercury is providing messaging platforms, facilitating the rapid transfer of information between relevant agencies, eg the Crown Prosecution Service, the courts and the police. In the health sector a number of projects are underway with organisations such as the Royal Colleges and the General Medical Council which store large quantities of data.

3. *Who will supply these services to consumers in the United Kingdom? How can the participating companies be categorised and what is the nature of the commercial relationships between them? How are suppliers likely to develop? What service standards exist and how are they likely to evolve?*

3.1 *A plethora of service providers*

As noted above, it is not possible to predict the services that will become available. It is therefore difficult to be certain who will supply the services. In the short term, many companies have valuable contributions to make, including:

- network operators;
- publishers;
- TV and radio producers;

- hardware manufacturers;
- software developers;
- broadcasters;
- Internet service providers.

The information revolution is exciting precisely because it is so unpredictable. The key to development is to prevent the stagnation which would arise from dominance of supply by a few companies, be they telecommunication companies, content owners or software companies. The policy must be to let a thousand flowers bloom. UK customers must have access to a full range of services, irrespective of whether these originate in the UK.

3.2 *Successful companies*

Although we have suggested types of company which should participate, we do not believe that it is possible at this stage to categorise them or define their relationships. In such an immature industry, the application of simple models, such as value chains is potentially misleading. It should be remembered that conventional thinking did not predict the development of the Internet!

Nevertheless, it is possible to identify some of the skills that are needed:

- *market understanding,* to enable service providers to identify groups of potential users and their specific needs.
- *creativity* in the development of content and applications. Successful applications will not necessarily be on-line equivalents of services currently available elsewhere. (A parallel can be drawn with the introduction of television; early programmes followed tried and tested formats which had evolved for wireless. Both programme makers and viewers took time to come to terms with the different creative possibilities offered by the new medium.)
- *customer service* to enable users to make the most of applications. Working with customers to maximise the benefits they derive from services is a major preoccupation for telecommunications companies such as Mercury, which have much to contribute in this area.
- *network operation,* to provide the seamless interconnection of computers which is the basis of the "Information Superhighway".

3.3 *Service standards*

The most important Internet service standard is the World Wide Web (WWW or Web) format, and its underlying Hypertext Markup Language (HTML) for the graphical presentation of information. It is this standard which has made the Internet usable by non-experts. HTML is in some ways comparable to the advent of graphical user interfaces (GUIs) on PCs.

Perhaps the most significant Internet development is the move from static displays of information to dynamic, real time presentations of information. Whilst there are no defined standards for many developments, it is often the case that the most widely-used implementation becomes a *de facto* standard. Developments of note and widely used implementations include:

- telephony across the Internet, using for example VocalTec's Internet Telephone software;
- interaction with Web Pages via "forms" which enable the input of information;
- broadcast audio information, via RealAudio software;
- creation of Web "virtual environments" using Virtual Reality Modelling Language (VRML);
- transmission of video information, of which the CUSeeMe videoconferencing application is an early example;
- development of network-oriented applications using the Java programming language.

It is important to realise that most of those applications are able to work with a standard or ISDN telephone connection. Whilst they will drive the installation of higher bandwidth communications infrastructure, this will happen in an incremental, evolutionary fashion. *The communications revolution will not be delivered by building a £15 billion information superhighway.*

4. *How can universal access to services provided for the common good be secured within a commercially competitive market framework?*

Much attention has been paid to universal service, and to the need to avoid creating information "haves and have-nots". Clearly this is an important issue for the future, and policy-makers are quite rightly examining universal access in some detail before delivery of essential public information by modern communications technology becomes the norm.

Mercury has a number of observations on the debate:

— It is not yet clear which, if any, services will become important enough to merit universal provision for the common good. Neither Mercury nor other service and infrastructure providers should be expected to make the social policy decision on what services must be provided "for the common good".

— Universal service should be a market issue. The market should be able to meet the universal service objective free of any unnecessary regulatory constraints. By allowing operators the maximum freedom, consistent with their market power, to price based on their own business decisions, they will be able to meet the demands of any customer who can be served economically. Dominant operators will continue to need to be subject to regulatory price constraint.

— Allowing fair and free competition will deliver customer choice, with all operators able to define and meet the needs of individual customer segments. By understanding the needs of customer groups, services can be tailored individually. This will minimise the size of any universal service requirement whilst delivering true choice to customers.

— The critical question remains of who will serve any uneconomic customers. Where the market is unable to deliver universal service unaided there will be a need for regulation to ensure that the obligation is fulfilled. Regulator could use a variety of methods to meet the shortfall. These could include negotiating with operators to introduce subsidised specialist low user schemes or more radical options of franchising or bidding for "uneconomic" customers or customers showing their operator preference throught voucher schemes.

— Clearly, PC penetration in the UK is far below that of telephone penetration. However, delivery of essential public information services must not be contingent on having sophisticated equipment available in the home. Kiosks in public places can improve the access to information services of the "have-nots". Libraries and schools are also obvious centres for improving public access, and the vast majority are already connected to modern communications networks. Mercury also notes the potential importance of "Internet Cafes" in providing ad-hoc access to the Internet for domestic users without the relevant equipment at home.

— Taking education as an example, with a modem, a PC and a subscription to an on-line service provider (and perhaps an extra (BT or cable) telephone line) any school can have access to "information superhighway" services. The more pressing need is for innovative approaches to leverage the scarce skills available to provide children and adults with the opportunities they deserve. This is likely to involve special software to provide easy access to on-line services in a teaching environment; it is unlikely to involve huge infrastructure investments.

— It is important that decisions about connecting public centres are taken on sound social and economic policy grounds.

5. *What is the role of central Government in connection with the "Information Superhighway" service provision, including the following areas:*

(i) *leadership*
(ii) *promoting inward investment*
(iii) *promoting and safeguarding the interests of UK firms worldwide*
(iv) *promoting network compatibility*
(v) *access to Government information*
(vi) *security of payment*
(vii) *data protection, confidentiality and censorship*
(viii) *verification of information; and*
(ix) *promoting the development of UK-oriented software?*

Mercury has comments on most of these aspects:

Leadership The critical role for Government is in providing the right regulatory framework for a healthy competitive market in services to flourish. Programmes such as the Information Society Initiative are helpful in providing a showcase for practical applications of communications technologies. It is however unlikely that Government alone could provide "leadership" for a continuing information revolution, the main driver of which will be consumer demand. A more appropriate role would be to provide an example for others in the use and provision of online services. We recommend that Government considers the benefits of the early adoption of applications such as:

- — online purchase of goods and services (bearing in mind the security aspects raised at 1.5 above);
- — online submission of data such as passport applications and tax returns;
- — electronic publication of information.

Promoting and safeguarding the interests of UK firms worldwide The interests of UK firms are best served by encouraging the same degree of competition worldwide as in the UK. Government should therefore object to the development or continuation of market dominance—in networks, software, payment systems or other areas—throughout the world.

Mercury supports entirely the promotional role played by Government under programmes such as the Infomation Society Initiative.

Promoting network compatibility Government can ensure equality of access to networks—ie, that any service provider can deliver services over any network. There remains work to be done in this area. Mercury's experience of serving indirect customers in telephony is that difficulties arise where the network operator with which we are connecting, ie, BT, offers insufficient functionality for Mercury to offer services we could otherwise make available.

Access to Government information The CCTA is supporting Government departments which wish to place information on the Internet, in addition to providing a trial Internet Access service delivered via the Mercury-provided Government Telecommunications Network. Furthermore, CCTA provides one of the co-chairman of the Government On-Line (GOL) project, an international project designed to encourage G7 and non-G7 countries to collaborate in ways of improving service delivery to the citizen using on-line services. Mercury applauds these initiatives and is engaged in a number of discussions with the relevant parties to assess the potential for Mercury to contribute.

Security payment As noted at 1.5 above, systems to improve the security of payment are in development. Again, Government can set an example by adopting systems, which may improve public confidence—for example introducing electronic payment for Government publications and services. There is a range of approaches to this, including encrypted credit card data, "e-cash" and "micropayment". Resolution of the issue is likely to be delayed by technical difficulties, competing solutions and consumer concerns over security. Nevertheless, it is already possible to purchase goods and services in a variety of ways with, arguably, as much security as in a credit card purchase over the phone.

Data protection, confidentiality and censorship The UK already has laws covering key areas such as data protection, copyright, intellectual property rights, libel and obscene publications. Since it is impossible to judge at this stage how communications technologies will develop, it is not practical to introduce rigid laws to cover all possibilities. The practicalities of a global communications market suggest that in any case national laws will be largely irrelevant.

It is not reasonable to expect network operators to take steps to police services carried over their networks, unless the operator is adding value to and therefore taking responsibility for the offending content or application.

Promoting the development of UK-oriented software The critical issue is not the promotion of UK-oriented software—as noted above product development will be demand-led—but promoting UK-developed software. The UK, with a strong background in software and service development, and as an English-speaking country, is very well placed to develop services.

6. *What is the role of local and regional Government in connection with the "Information Superhighway"? How can new services be used to boost (a) the ongoing regeneration of urban areas, and (b) other local economies?*

Local and regional Government's primary role will be as a user of services. It is for local Government to address the issues raised by these questions.

7. *What will be the impact of the "Information Superhighway" on working practices and employment prospects?*

Much comment on future working practices, as on the Information Superhighway in general, has been naive and simplistic. Widespread adoption of "telecommuting" and "virtual organisations" will require much more than just the availability of infrastructure and applications, since significant changes in human behaviour are also implied.

Nevertheless, smaller scale developments, such as "virtual teams" and "distributed working" will continue to spread where there are benefits to both employers and employees.

Mercury itself has identified such opportunities, and many Mercury employees are equipped to work from home or on the move. Mercury's development activities are focused on areas which will contribute to changing the way people work, including:

- *Mobile and packaged services,* including the capability to help people work "away from base", by providing office-grade communications from anywhere in the world;
- *Online services,* helping to make staff more effective by providing easy to use information, communications and purchasing services, directly to the desktop;
- *Group working services,* enabling people from different departments, countries and companies to work together effectively as a team.

Mercury expects that the impact of the "Information Superhighway" on employment prospects will be comparable with that of the software industry in earlier years. As in that case, the key will be the availability of suitably trained people and a healthy, competitive market.

8. Is the dominance of mass-market US software a threat or an opportunity? What hard commercial initiatives can be made (as opposed to "collaborative" ventures such as RACE or ESPRIT) to respond to this dominance?

The dominance of mass-market US software is neither a threat nor an opportunity, since:

- software capability alone is no more a guarantor of success in "Information Superhighway applications" than is ownership of a telecommunications network.
- the open nature of the Internet means that any company with an attractive service will have access to a delivery mechanism.
- the distribution economies of scale affecting traditional areas of software product development companies do not arise. Netscape is a good example of a software product which has been built from nowhere.
- it is an advantage being quick and nimble in such a fast-moving environment.

Government can not launch hard commercial initiatives which will guarantee success. Its role must be to highlight the opportunity for UK companies to benefit from the information revolution, and encourage participation.

Mercury Communications Ltd.

January 1996
Updated June 1996

Examination of witnesses

Mr Christopher Weston, Group Manager, Commercial and Regulatory Strategy, and Mr Chris Jenkin, Manager, On-Line Services Development, Mercury Communications Ltd, called in and examined.

Chairman

862. Mr Weston, Mr Jenkin, welcome to the Sub-Committee. Perhaps you would like to introduce yourselves and please make any introductory statement you think might be helpful.

Mr Christopher Weston and Mr Chris Jenkin

(*Mr Weston*) My Lord Chairman, good morning. My name is Christopher Weston, I am responsible for Mercury Communications' regulatory and commercial strategy.

(*Mr Jenkin*) My Lord Chairman, good morning. My name is Chris Jenkin, I am responsible for on-line services development for Mercury, which encompasses the management of product and development for Mercury's Internet businesses.

(*Mr Weston*) I would like to thank you very much for allowing us to re-schedule our opportunity to give evidence. Last time there were other factors—BT and Cable & Wireless—which tended to take up some of our time. We do apologise for that.

863. At least the world has moved on a little, which may enable you to comment slightly differently!

(*Mr Weston*) Indeed. First of all, I would like to say Mercury, as you know, has gone through a restructuring in the last year or so, and it has gone about focusing very much on what the customer wants, and that is indeed the way we have segmented the market. So we are very pleased to see you are looking at applications in society here and focusing on the services the customer would be interested in. However, we are a telecommunications company and we have invested a large amount in infrastructure and that is really based upon the Government's policy of infrastructure competition which underpins all the investment in local loop access, which allows us to deliver such services to our customers. The Information Superhighway does not really exist at the moment and maybe one of the closest approximations to it is the Internet, and indeed Mr Jenkin will give us some idea about that later, but in the future we will see it will only be a component of the Information Superhighway. Some of the problems which currently face the Internet and the Information Superhighway arise when we are looking at providing services to our customers—and

Chairman *contd.*]

we have done a lot of work on this recently—and it is the bandwidth or speed of access to those customers in giving them these services. This will become increasingly important in the future and it is not just focused at the access level, it will also be focused back into the core trunk network where you need sufficient capacity to deliver these services. This is really looking at the developments and interaction of core services and also, if you like, high detailed graphics when you are down-loading to the customer. What we have to face and answer is how we get this access to the customer, so we can serve these customers with high bandwidth applications, and it really is looking at the access. How is it best done? How do you "incent" the providers to give this access? Under the Government's policy of infrastructure competition, which is promoting this, you will see there is an incentive to produce high bandwidth access to the customer. Mercury's opening statement welcomes and supports the policy of infrastructure competition and how it will enable us to be capable of providing services consumers want in the future.

Baroness Hogg

864. Would you like to up-date your evidence to take account of the developments since you submitted it in the regulatory area? Is Mercury satisfied with the present regulatory and pricing structures in telecommunications? I am thinking in particular of the recent statement from Oftel.

(*Mr Weston*) Yes, we were very pleased indeed to see the DG decide to rule as he did on the price cap. One of the concerns we had with the continuation of the broad cap, set between 5 and 9 as it was first proposed, was that it would not allow us or enable us to carry on investing in infrastructure, and we went to present to both the DTI and Oftel on this, principally on wireless local loop, a new technology, which we would not be able to use to serve more customers and areas in the UK. Beyond that, it is wire line access, rolling out fibre optics to specific areas in the UK where the economics justify it. So we are very pleased to see a structure has been put in place to support that. Another area we were particularly pleased with as well was the proposals for prohibition of anti-competitive practices which the Director General put in place. Although we would like to see primary legislation for this kind of abuse of market power we support what the DG has done. We did have concerns about the appeal process but he has gone a long way in mentioning he would like to expand the use of an expert panel, and that has helped a lot. It brings into the public eye the thought process behind the decisions he makes, and really allows us to take advantage of the avenue of judicial review for overturning various decisions or challenging them should that be necessary. One or two other things which spring to mind on the regulatory front are, number one, number portability, and that is very important especially when you are looking at local operators like cable operators, so they can bring on more customers; the ability of the customer to be able to keep his number. So we were very pleased to see that. Another area we are a little concerned about is the European Union. We have to be sure that what is being proposed by the European Union is being supported or realised in what Oftel are saying, and there is an increasing amount of need for consistency between the two.

865. What are your points of particular concern on the inconsistency?

(*Mr Weston*) At the moment we are not sure what will be the impact of the Council's Directive on Interconnect. We need more clarity on that. I know a draft Interconnect directive was issued on 20th May and we are still analysing that, but it is not clear to us at the moment exactly what the repercussions of that will be.

866. Are you looking for primary legislation in terms of general competition policy legislation or specific to telecommunications on the abuse of the market?

(*Mr Weston*) With regard to Mercury, it would be primarily for telecommunications but it would be extended, I would imagine as primary legislation, to general anti-competitive practices in primary legislation.

Lord Flowers

867. You say in your written evidence to us, "Although there has been extensive debate on information superhighways and ..." such like, "... the UK remains a long way from finding answers to the questions involved. This will continue to be the case while debate focuses on infrastructure instead of applications and services." I wondered whether you would like to extemporise on that theme a little and make some remarks possibly about whether or not there should be a distinction made between the network sector and the service sector?

(*Mr Weston*) The idea of focusing on the infrastructure is something we have looked at in great detail recently to try and get services to our customers. We do say that there are limitations at the moment to the Information Superhighway, but we do also realise the Internet is that; everyone who has a computer and a telephone line, as the gentleman from QVC pointed out, has access to the Internet. So that, if you like, is the genesis of it. We would like to see when you start to look at providing Information Superhighway-type products and services it does not just focus on the Internet, that there is the ability to offer other services beyond that. The question then is the type of access you need to be able to provide those services, so broad band infrastructure at the local loop and indeed the trunk network level. When we come to look at splitting a company like Mercury or BT into two areas, one to provide network-type services, and two, service providers, we then begin to question the ability of the incentive for the network service providers to invest in the type of technology they would require to provide the type of access they need. We also need to look at the way it is implemented in the market; there has to be co-ordination between the largest operators in the UK market—BT and Mercury—because you cannot have one doing it without the other doing it. Our conclusion from looking at it would be that we would not support splitting the companies, or indeed the

Lord Flowers *contd.*]

provision of services, between networks and service providers.

(*Mr Jenkin*) There was also a context at the time of the written evidence of BT's requirement to invest significantly in local loop infrastructure, to bring fibre optics to homes and businesses. Our view was that was not an essential pre-requisite to information applications in society, that the Internet and narrow bandwidth services are providing a very healthy test bed and indeed commercial area for on-line services to businesses and homes. Although it would be attractive to have a higher bandwidth to each individual home and business, it is not currently essential to allow the Internet service and market to take off. That will develop and infrastructure competition will enable companies to invest in the infrastructure, to expand the bandwidth into the home, and also nationally and internationally the bandwidth services to take off. We do not believe there is a need to foster local loop high bandwidth at this current time, there is sufficient bandwidth around for attractive services to be delivered to homes and businesses today.

868. You heard our witnesses from QVC and they put a great deal of emphasis, a great deal, on the customer needing and wanting video.

(*Mr Jenkin*) Yes. I think obviously they are talking about quite a specific range of services which require very specific visual aids to that transaction. There are very many services which do not require that and information, which is one of the biggest on-line services, does not require visual aids to enable that to be delivered. There are many aspects of professional and advisory services as well which do not require those visual aids. There are many examples of transaction services, for example, small businesses wishing to buy standard office equipment which will be increasingly available on-line very simply and do not require that. So I feel the QVC approach is very much targeted towards television becoming interactive, which is very much a growth point for the TV services industry, and is not in any way a substitute for the growth of on-line services to homes and businesses.

869. I do not speak for QVC you understand, but I would have thought they would have said to what you have just said that any presentation you can make statically, so to speak, you can make very much better in a dynamic fashion; you can actually see the salesman giving his patter, you can walk around the table you are thinking of buying and can look at it from all angles and so on.

(*Mr Jenkin*) Indeed, but it is the cost of service delivery which comes into the equation. Doing that in the on-line domain is very expensive; to enable high bandwidth service delivery from a remote service platform to a home or business is very expensive, and the cost of preparing also the audio-visual material is very high.

870. So is it better that services be separated from network provision?

(*Mr Jenkin*) It is not appropriate that service providers are able to access networks at a cost which disables network operators from investing in infrastructure.

(*Mr Weston*) We looked quite carefully at this and were looking at the economics of providing access for customers to the types of services they needed. Depending on where they are in the market, you might best serve their needs currently through let's say a copper connect to their house, but at the same time you put that copper wire into their house you might also put in fibre optics next to it but not put the expensive terminating equipment at the end and only do that when the services they demand (which might come further in the future, like the video type services and that type of service) justifies the cost which needs to be incurred to put those in place.

Lord Hollick

871. You caution in your paper against the emergence of a dominant player in the market, or over-dominant players. If we look to the experience of the United States, they discovered that allowing the carrier to be the dominant service provider gave them an undue dominance, and there are some who say the same situation is arising in satellite television in the United Kingdom. Therefore, I am slightly surprised that you were relaxed about allowing the network to be the principal service provider and not separating them out.

(*Mr Weston*) When we looked at the United States we found with the regulations until a few months ago, when the Telecoms Bill was passed, the environment there was very different from the one in the United Kingdom. They purposely segregated the market into local loop providers who provide telecom services, who are mainly cable operators, from the IFCs, the longer distance providers. They did that because they believed the local loop, where the R.B.O.C. (Regional Bell Operating Company) was, was a natural monopoly, and we have seen since that the technology has by-passed that bottleneck. During that time we also saw that within the local loop areas you had the R.B.O.C, the big local loop operators, present and you also found the cable operators beginning to build out. So by the time the Telecoms Bill came into being in January of this year in the United States you found there were pretty much in most parts of the United States two competing infrastructures already into the home, and that is being further augmented by wireless, mobile, et cetera. So the United States are some way ahead of us in the infrastructure they currently have to provide services to their customers. They have now reached the stage where it is better to make the infrastructure open to the service provider and allow service providers to unbundle, if you like, the telecoms and cable network and use the bits they require to provide services to customers. We have not yet reached that point of development within the UK market. In the UK market BT has 95 per cent of the access lines to customers, but very rapidly, although very young still, you have the cable operators building out competing networks; you have providers like Mercury and Energis also providing networks, and Ionica has just been launched on the market. So we are still catching up to that point when you start to split the network from the service providers.

Chairman

872. Perhaps we could move on to the barriers to making the Information Superhighway a reality. What would you like to say about that?

(*Mr Weston*) I think we have actually touched upon some of that, like speed of access, although my colleague pointed out there are a lot of narrow band products which are being offered now, and indeed offered very successfully. In the future we will begin to see much greater demand, as QVC said, for moving videos, for, if you like, weather maps which are down-loaded in half a second. I think it is for the future that we have to start realising we need a higher speed of access, and how that is rolled out into the network will allow us to provide these services to the customers. So it is a barrier but it will be slowly overcome in the next few years as local loop access is provided in an alternative form by the cable operators. At the same time you have the cost or price of access to the customer. The UK is the most competitive market, arguably, in the world, we have 153 telecommunication operators in many forms in the UK market, driving down the price very rapidly. We also have the latest price controls proposed by the Director General, primarily focusing on the area of the market where there is not competition to again drive down prices. So both the regulation as competition becomes more effective in the residential market, and the competition at the larger end of the business market, will effectively begin to overcome that barrier as well.

(*Mr Jenkin*) I think there are barriers to do with simple PC awareness and literacy in the UK, and for many people accessing the Internet is a rather daunting prospect. We have mentioned the issue of security and people are concerned about going beyond searching information to purchasing goods and services because of the concern about security. We believe the security concerns are a practical consideration which will be overcome during the course of this year. There are currently Internet sites in the UK which are considered to be satisfactorily secure to submit credit cards to purchase goods and services. These technologies will become rolled out elsewhere, consumer confidence will grow, there will be the odd scare story but eventually there will be confidence and other service providers will adopt the technology and that market will grow. Copyright was also mentioned earlier, and this is potentially quite a serious impediment to the wider use of the Internet for distributing commercially valuable information, in that we need to be sure that as the Internet is available on a worldwide basis those who own the copyright have some confidence their rights are being protected by international agreements, and that is an area currently of some difficulty in the printed media and CD media, and it remains an issue in the on-line area which we hope will be gradually resolved.

Lord Gregson

873. On these barriers to future development, we have been told for instance that the present home-used PCs are paid for in effect by people in the family rather than being commissioned, and it is limited to families with an average income of £45,000 a year, which is just about the top 7 per cent of the population. Is not the up-front cost the biggest barrier which exists at the present time to spreading the use of the Internet?

(*Mr Jenkin*) Certainly for those without a PC and modem at home, they are looking at a cost of around £1,000 to become equipped—

874. We were given £2,000 to be fully equipped to use the Internet.

(*Mr Jenkin*) £1,000 is sufficient today to be equipped and connected to the Internet. As you say, that is a barrier for many families but clearly there are few families who will spend that amount of money for a PC simply to access the Internet.

875. Few families can spend that amount of money, that is the question.

(*Mr Jenkin*) Indeed. As a provider of services to the market place, our view is that the market is those who are already PC-equipped, so we are monitoring those homes with PCs or with a PC plus modem and we find they have very attractive demographics, so it is an attractive market to service. But when considering the question of the information-haves and have nots in the future, there will be a barrier if information which is of high use to the citizen is only available if you have invested in a PC. That will clearly be a barrier, perhaps to Government doing its business. But we also believe that the development of what we call the "net surfers", the low cost Internet-only terminals, will provide a means of access for those who cannot afford a full PC. There are plans to put in a number of public Internet access terminals in various places which are equivalent to public libraries, and in fact libraries are using that facility now.

876. It is a bit like the operation of the Poor Law. You have to go to an institution; you cannot have it in your home because you cannot afford it, so you have to go to an institution.

(*Mr Jenkin*) I might challenge that. The libraries would not perhaps consider themselves necessarily as institutions—

877. And they are disappearing rapidly of course; 43 libraries in Yorkshire closed down last week.

(*Mr Jenkin*) Yes, that is true.

Baroness Hogg

878. The way you have described it, and you may not necessarily have meant it like this, is that it is almost a kind of second-best for those who cannot afford it, but actually will it be a second-best? If video networks are sucking the back out of the computers and there are power problems, are they not a perfectly viable tool for accessing these services? If televisions are getting more expensive because of the need to build in chips to deal with the new digital services, is there going to be that much of a price gap between these two products, and will not the rental market break down some of that difference?

(*Mr Jenkin*) That is a very good question, and it is a moot point. It all depends on how rapidly the bandwidth to the home rises in terms of local loop, and international and national bandwidths, to enable an Internet terminal computer to be effective. Because to be effective it has to down-load applications from the network very rapidly, and

Baroness Hogg *contd.*]

unless you have an ISDN at least to the homes and unless the Internet community has high speed networks all over at least the western world, they will not take off. I see quite a complex dynamic building up. It may be such that it will become very successful, but equally it may not.

Lord Gregson

879. Does it not strike you as strange that networking computers are being produced almost wholly in America at this time? If we are so advanced in this technology, in cabling et cetera, why are you not encouraging people in the UK to develop the networking? Because you are on the other end of it.

(*Mr Weston*) We provide the transport mechanism.

880. BT do a lot of work developing up-front equipment.

(*Mr Weston*) I know, and unfortunately Mercury does not quite have the breadth of resource to be able to invest as much as we would like to in this area.

881. Your principals do.

(*Mr Weston*) Cable & Wireless, our major shareholder, does and when we can we will avail ourselves of the technology which, for instance, is being trialled in multi-media in Hong Kong Telecoms. But Mercury itself two years ago went through a stage where it made a brief foray into multi-media and it cost us an awful lot of money and it did not really work. After that, we had to go through a restructuring and making redundant 2,500 people. So we are quite wary about looking into that pool again and using our scarce resources to exploit that market.

882. Long-purse patience, is what you are saying.

(*Mr Weston*) Yes.

883. Why are American companies doing it?

(*Mr Weston*) Another factor, and maybe it is not quite telecommunications, is that we see American computer companies are really very dominant, with the Japanese and Far East computer companies. In the UK it is a resource which, as far as I am aware and I am very much a layman in this subject, has declined over the last few years. So it would not surprise me to see this development occur in the US and maybe the Far East.

(*Mr Jenkin*) The US tends to be about 18 months ahead of the UK in terms of the development of information market places, so one would expect these developments to occur. Acorn Computers have announced the launch of their Net Surfer in the autumn of this year, and that was designed from Oracle Computers, so yes, it is an American design but Acorn in fact won the award to bring the design to fruition and have financial plans to manufacture the terminal from the autumn. There is a lot of speculation that it may be Acorn's second wind in the UK market place.

884. They hope so!

(*Mr Jenkin*) Certainly.

Lord Craig of Radley

885. I would like to contrast two of the statements in your summary and recommendations. You say, "Developments will be customer-driven and unpredictable." You then go on later to stress the importance of avoiding the "type of dominance which has arisen in the UK telephony market." My question is, what regime, if any, do you believe should be put in place to avoid a dominance in the other areas of this information society like service providing and so on?

(*Mr Weston*) That is a very difficult question to answer. It is easy to look at the telecommunications market and see its shortcomings and what should be done about them, and indeed the Director General is beginning to move in that direction. If we start with digital terrestrial TV we see one of the important aspects for this is the access with the set top box. We might have a number of different providers for the services but the set top box would become if you like the bottleneck access point, which in the future everyone will have to have a form of access to at a reasonable cost. But I think that point is slightly different from the infrastructure which needs to be invested in telecommunications, which is significantly greater. But again I think there is a danger that you have that point of the set top box becoming a bottleneck, and when you design it (and I do not know about the technological constraints in this) you have to ensure the owners of the multiplexes who are providing the service to the set top box have equal access to the set top box.

886. In other words, it is a transparent box?

(*Mr Weston*) Yes.

887. Are there any other areas where you feel the shoe could pinch in that sense?

(*Mr Weston*) Not to my knowledge. When we look at cable operators we see one of the problems they have is the power of the provision of content—films, whatever—being provided to them. There is a position which BSkyB have which may limit the provision of services to the cable operators, and that is something which probably has to be watched in the set top box regimes.

(*Mr Jenkin*) It is just feasible that one of the solutions to security on the Internet is the development of the set top box, which then becomes an own gateway. But I think the Internet is so large and so diverse that is most unlikely to happen as it has happened in UK satellite television.

Lord Hollick

888. I would like to follow up Lord Craig's question. What initiatives do you think the Government should take in order to promote the development of the Superhighway to reduce certain barriers of entry? Also, picking up on one of the points you made in your summary and recommendations, to make it as universal as possible?

(*Mr Weston*) I think one of the major points that Government can act on is clarity of the regulatory environment. We have Mercury, cable operators and BT investing a lot of money in the local loop to be

Lord Hollick *contd.*]

able to provide these services to our customers. There could possibly be a change of government, and clarity in the overlap period has to be maintained. There is uncertainty provided by the European Union with their current Interconnect Directive and this does not help when looking at investment plans. Another point might be the Government leading by example and beginning to use Internet-type services, maybe to provide data for passports, et cetera, so society is being encouraged by Government to use it. That might be another way in which it could be supportive.

Lord Gregson

889. May I go back to this question of security? I get the feeling you are fairly certain that the security problem has been cracked. When you consider DOD has been hacked 68,000 times last year, one of the most sophisticated systems in the world, I am not too sure I follow your point on this. Considering also set top boxes, which you can buy for a few pence in Amsterdam for any system which is available, are you certain about this?

(*Mr Jenkin*) The security is really measured on the economic impact of incursions to your system. So BSkyB often come into the press because people have hacked the card, but it only comes into the press because until you have a reasonable number of people who have hacked in, so you can pin them down, it is not worth trying to pin them down. So you try and pin down the source of rogue cards and cut them off by changing the technology. It tends always to become a public thing before it gets stopped. The issue is where is the economic harm taking place, and providing you can manage your security policy such that you have no undue harm, then you are fairly secure.

890. You are saying they will have to absorb these various hackings and copies as part of the system?

(*Mr Jenkin*) Yes, there will be hackings and losses.

891. It is a matter of major concern, losses because of hacking cards.

(*Mr Jenkin*) Indeed.

892. It is a very easy thing to do, as you must know.

(*Mr Jenkin*) It is easy. This is a separate subject but there are many ways of doing it. It is not a question of just copying a card, you usually trace these things to a leak—someone has left papers lying around, someone has given information away which allows the hackers to do their job—so standard security arrangements are as always necessary in any situation of this sort.

893. You know, of course, in America you are not allowed to use a security system which cannot be cracked by the Treasury Department? So it is well-known these systems can be cracked. You are not allowed by law to use the high class 14 systems they use themselves.

(*Mr Jenkin*) There is a very big dilemma for the world security authorities and the telecoms service providers on this issue. There are various discussions underway to help them, for example the possibility of keys which would allow the security authority to unlock transmission to be held in an escrow in the event of a security alert, in terms of drugs or trafficking of some sort. That is being discussed and at some point governments will have to take a view as to whether they are able to prevent the use of high levels of security or not.

894. So there are still a lot of issues to be discussed on security?

(*Mr Jenkin*) Yes. This year a number of events are taking place which indicate that governments are willing to think differently now on this issue. I mentioned in my note the dropping of the prosecution against Philip Zimmermann in the US; and a very key statement from a meeting in Paris in February of this year of government security agencies and telcos was seen as a key move forward. But clearly in the end it is a matter of government policy as to what can be permitted and clearly governments have to think likewise. It is still the case, as you know, that we cannot get the Netscape Secure Server in this country because the DOD prevent it being exported. I am sure that will change in due course.

895. That is no use because that has probably been cracked. It is second-stage technology already, is it not?

(*Mr Jenkin*) The Netscape Secure Server is being used in the US but it cannot be exported.

Baroness Hogg

896. We have heard from a number of witnesses about this willingness of people in the UK to give their credit card over the phone whereas they are reluctant to use it over the Internet systems. As a business with interests in both telephony and now the interactive Internet-type services, do you think this preference is rational?

(*Mr Jenkin*) I think it is entirely rational.

897. That it is much more secure on the telephone?

(*Mr Jenkin*) I think it is rational because of people's experience and knowledge. It is not very often you hear stories of people having ordered something on the phone and their credit card number has been stolen. We trust the telephone wires—partly because they are now automatic, you have no one at the exchange listening in—and we also trust the credit card companies and mail order companies that they keep our information secure. Like in all aspects of commercial businesses, it is a matter of who you trust. Currently no one trusts the Internet because no one knows who the Internet is. There will be companies, and Barclay Square is one, who have been rated as being reasonably secure and there are some people who trust Barclay Square as being a site where you can safely put in your credit card number. The fact it has Barclays behind it as a premier bank in the UK clearly has something to do with that. If that goes on for sometime without a serious security scare that confidence will build. There are a number of smaller companies who already offer services requiring your credit card, some of them of course are fraudulent, they are simply trying to get your credit card number and they have no intention of providing any services, and that is a very hard problem to crack.

Baroness Hogg *contd.*]

898. But that problem arises with telephony and with phoney companies advertising you to telephone them.

(*Mr Jenkin*) Yes, exactly so, it is the same scam. Therefore you do not give your credit card number to an untrusted individual. So you do not ring up Bloggs Flowers necessarily and give them your credit card number, but you might ring up Interflora because you trust them. I think that applies in this medium as well as in normal telephone ordering. So it is a matter of trust and consumer confidence.

899. You seem therefore to be suggesting that this distinction, this preference, is not rational, that the same points apply? If you are dealing through the Internet with a quality name you should be as confident as dealing with a quality name down the telephone, but is that really so?

(*Mr Jenkin*) I think that can be the case. It depends how it is packaged. I think the Barclay Square example is interesting because it is a very heavily Barclays-branded site and you go through Barclays first before you get to the shops on the square, and therefore you have some confidence you are in a trusted environment. If it was simply a local flower shop and in the corner it said, "Supported by Barclays" you might not feel quite so comfortable and think, "If it all goes wrong, can I sue Barclays for using my credit card?"

Lord Gregson

900. Every time you use your credit card you give it to somebody to copy—every time.

(*Mr Jenkin*) Absolutely.

901. You know, of course, that in the credit card business there is a very large cost for fraud, it is several hundred million pounds a year.

(*Mr Jenkin*) Indeed. It is some 5 or 7 per cent of their overall business, I believe.

(*Mr Weston*) You also find that some large firms in the States are beginning to build trust in transactions over the Internet by guaranteeing those transactions. I think that was a condition that AT&D put in when they launched their Internet service, so that is building trust.

Chairman

902. Can we turn to the global aspects of the Superhighway? I wonder whether you think there is a need or even a potential for a global initiative on issues like data protection, freedom of access, copyright and so on?

(*Mr Jenkin*) On some of those issues, particularly data protection and copyright, and I am not familiar with all the forms which are in place to discuss them, there is a lot of work which needs to be done. There is much discussion between the West and some of the modernising countries, especially in the Far East, over the issue of copyright protection. This issue is going to be even more relevant with the Internet because of its global reach, and that is an important area. That I think is probably the main area where some international co-operation would be helpful to foster the growth of these services, given that the Internet is by definition an international medium and most usefully it is accessing services and communicating with those in other countries.

903. Does there not also need to be some uniformity in national attitudes to the transmission of, for example, pornography?

(*Mr Jenkin*) That is also clearly an important issue and unless the main governments involved can co-ordinate their policy, we will continue to see disconnections of policy, which means that services which are accepted in one country are not available elsewhere, and therefore not available anywhere. We believe it will be possible to provide means for, let us say, the parents to control what is available on their PC screens. It will always be possible for someone to find a way round that, so it is a battle you never win, you have to keep one step ahead of those who publish things which are not suitable. I think governments can do something there to co-ordinate their approaches to unsuitable material over the Internet. There is also clearly a regulatory question over who is responsible for that. Our position is clearly that if as a network operator you are simply transmitting, you are a bit transmitter, then you cannot be held responsible for what is being transmitted, but that debate still has a little while to run in the UK. In the US it is fairly well concluded but here legislation has not been completed.

904. I am afraid time has run out. Could I ask you that since it is a little while since you produced the written evidence, and as I said things have moved on a little as your evidence today shows, and since your written evidence will be published in due course, could I invite you to up-date it for us within the next week or so?

(*Mr Weston*) Certainly, my Lord Chairman.

Chairman] Thank you very much, and thank you very much for some very helpful evidence.

TUESDAY 18 JUNE 1996

Present:

Butterworth, L.	Haskel, L.
Craig of Radley, L.	Hogg, B.
Flowers, L.	Hollick, L.
Gregson, L.	Phillips of Ellesmere, L. (Chairman)

Memorandum by the Independent Television Commission (ITC)

THE INDEPENDENT TELEVISION COMMISSION

1. The ITC is the public body established by the Broadcasting Act 1990 to license and regulate commercial television services in the United Kingdom. These include not only terrestrial, satellite and cable television programme services but also local delivery services by which such programmes are distributed over cable or MVDS (Microwave Video Distribution Service) systems.

THE ITC'S INTERESTS IN THE INFORMATION SUPERHIGHWAY

2. The ITC's responsibilities relate to the Select Committee's enquiry in three different ways. The first is through its interest in licensing local delivery services, by which the process of extending broadband cable systems throughout the United Kingdom is undertaken. The second is through the licensing of television programme services and the consequent regulation of their content. The third is through the carrying out, under subcontract arrangements, of technical research and development projects in consultation with its licensees. These three areas are explored in greater depth below.

LOCAL DELIVERY SERVICES

3. The ITC is the successor to the Cable Authority as the national franchising body for cable systems or, since the 1990 Act, for systems which use microwave distribution for delivering television services direct to viewers' homes (MVDS). Each franchise covers a defined geographical area, of varying size as determined by the ITC and, before that, by the Cable Authority. The largest such area is for the whole of Northern Ireland; the smallest for Thamesmead in Southeast London. The practice has been to grant only one licence for each area, so that the franchisee enjoys for the time being exclusive rights to provide cable television within the area concerned. Franchisees are also licensed by the Department of Trade and Industry to provide telecommunication services, but those licences are not exclusive: there will be others, most notably BT, in competition to provide telephone and other telecommunication services. While the exclusivity of local delivery licences remains, however, the ITC's franchisees are alone in the ability to operate systems which combine the capabilities of television and telecommunications.

4. The ITC has a statutory duty, embodied in section 2 of the 1990 Act, to ensure that services are available as widely as possible throughout the UK. There are currently 149 franchises awarded, which embrace a total of about 18 million homes, out of the total of about 22.5 million homes in the UK. The franchises are still under construction, at a rate of about two million homes a year, and currently pass or make services available to about six million homes. The ITC has a continuing programme of considering new franchises but most of the areas which remain unfranchised include only small towns and villages. For this reason, economics may dictate that the last 15 per cent of UK households cannot viably be served by broadband cable, unless that is done through the upgrading of the capabilities of networks which are already in place (ie, BT's).

5. Those obtaining licences since 1991 have had the choice of installing cable or using MVDS or a combination of the two. The ability to utilise microwave distribution has not yet been implemented, because the necessary technology has not been available. The first field trials of newly developed equipment are due to commence shortly. While it has been predicted that the use of MVDS, by avoiding the high cost of installing cable, might permit services to be delivered more widely in rural areas, this remains to be demonstrated. Although the use of the 2GHz band has been permitted elsewhere, such as in the USA and the Irish Republic, allowing premises within a radius of 25 miles or so to be served, the UK Government has allocated the band between 40.5 and 42.5 GHz, which will probably limit transmissions to about two to three miles. In these circumstances, the cost of establishing each transmitter, with direct line of sight to receiving antennas, might not be justified by the number of homes within range likely to subscribe. The results of trials might provide a better basis for assessing the potential.

6. The franchises awarded by the Cable Authority—which constitute most of those currently in existence—were considered against the criteria set out in the Cable and Broadcasting Act 1984 relating to the services which each applicant proposed to provide. Every licence now has conditions attached to it requiring the licensee to provide services of a kind reflecting the original proposals. These fall into six categories: the overall number and range of television channels; local text information services; local programmes; community access; interactive services; and telecommunications services. By and large, the licences do not contain specific obligations to provide advanced services of a "Superhighway" nature, because few applicants at the time they submitted their applications (pre-1990) had confidence in what would be practicable or viable in the future.

7. Franchises awarded since the 1990 Act came into force carry no obligations relating to specific services, because the competitive tendering arrangements do not permit any consideration of what services will be provided. The effect of the 1990 Act is that as the earlier franchises expire and are replaced by new ones, the existing service obligations will fall. This may not make a significant difference in practice: the services provided are in any case likely to be those which make economic sense, despite the fact that some companies now suggest that one of the reasons for providing local television services is the regulatory expectation on them.

Local delivery services and BT

8. A reference to BT's position may be appropriate given debate about how the information superhighway might best be implemented in the future. In the context of cable and local delivery, BT is placed in exactly the same position as any other company. It may provide cable television services if it successfully applies for a franchise or acquires a company which holds one or more franchises, but it may not do so without a franchise. A BT subsidiary company operates the cable franchise for the City of Westminster and BT also operates some older systems which pre-dated the franchising arrangements, in Milton Keynes, the Barbican, Washington and Irvine. A few years ago, BT sold off other franchises it had acquired or been awarded, in Aberdeen, Coventry, Swindon and the Thames Valley.

9. Because of its concern that its franchisees should meet their obligations, the ITC has supported the Government's policy of not extending, before the year 2001, BT's right to compete with cable operators, that is, by giving BT a special position of freedom to provide entertainment services without a franchise. The economics of cable, particularly given a less buoyant market for cable television than many had forecast, are not so robust as to be obviously able to withstand competition in the market. Without a period of protection against such competition, therefore, there appears to be a substantial risk that the major investment being made in broadband cable systems would be jeopardised. Reduced confidence in a satisfactory return from that investment could well lead to the sources of funding drying up.

10. The need for a franchise from the ITC applies only where television services are distributed over a telecommunications system "for simultaneous reception in two or more dwelling houses". Accordingly, a service which does not entail simultaneous reception of programmes in two homes, such as video-on-demand, may be provided outside the franchising arrangements (while still requiring an ITC programme licence). BT is therefore free to provide video-on-demand anywhere in the country, as it is doing on a trial basis in Ipswich and Colchester (and Kingston Communications is about to do in Hull).

Technical capabilities of the systems being built

11. The ITC is not responsible for the technical standards of local delivery systems: conditions of this nature are included in the licence issued by the DTI under the Telecommunications Act 1984. Broadly, systems are required to be broadband and interactive but their actual capabilities today are geared to the current state of technical development and to the services for which there is a current demand. The future potential of these systems lies in the capacity of the newly constructed underground duct infrastructure, through which new cables can be pulled as required, and the considerable amount of optical fibre which is being built into all the main cable runs.

12. One example of a technical limitation is that, for the purposes of cable television, the set-top converters which are currently on the market, enabling the tuning between more channels than most television sets can cope with and providing the means by which services received by each customer are controlled according to what they pay for, are limited to 550MHz (allowing about 45 channels to be provided). Although the network itself may be engineered to higher standards, the carriage of a larger number of channels depends on enhanced analogue set-tops (750MHz versions should be available for delivery this year) or new digital set-tops, allowing a multiplication of channels through compression techniques (which will take a little longer).

13. Another example, on the telephony side, is that cable operators are installing separate wires (though usually combined in a single sheath) into the home for television and telephone services, simply because it is so far more robust and reliable to provide services in this way than to utilise the techniques which have been developed to combine telephone signals on to the same coaxial cable that carries the television signal. Practice will change, and networks will be modified or enhanced, when the state of technical development makes it

sensible to do. Optical fibre direct into the home may be a little further off, if for no other reason than that television sets cannot recognise an optical signal and the equipment to convert from optical to electronic distribution is still prohibitively expensive to be installed in every home: the cost needs to be amortised by the coversion taking place at a point in the network (which is today much closer to the home than it was five years ago) which makes economic sense. While one factor will be the rate at which these costs diminish, installing fibre to the home will also depend on services developing which need greater capacity than can currently be provided, which does not appear to be an early prospect.

14. There is a growing need for network interconnection and interoperability, and service development can again be expected to force the pace on the extent to which this is actually done. The ITC's licensees are involved in various initiatives to extend the co-operation between separate companies through at this stage for example, the London Interconnect, The Midlands Interconnect and the Northern Interconnect. From its experience the ITC is not aware of any specific problems of incompatibility, but further work will be necessary to ensure that future digital standards avoid such problems.

THE PROVISION OF SERVICES

15. As was indicated earlier, the ITC has an interest in the services which its cable licensees develop, against the background of the proposals submitted in each pre-1990 franchise application. Although much of the publicity surrounding the launch of what was called the cable revolution in the early 1980's related to interactive services, cable operators currently have two distinct businesses of a not very innovative nature: the distribution of cable television channels and the provision of a plain old telephone service. Other services are being explored or trialled but the picture is of a series of different initiatives, often localised, without a strong national theme.

16. It may nevertheless be useful to describe various forms of service being provided or in development, such as the following:

(a) Text information services, often enhanced with photovideotext. Most cable operators provide services of this kind, even if confined to programme guides to what is on the television channels carried, local entertainment listings, information about forthcoming events from coffee mornings to concerts etc. Many cable operators work with their local authorities, sometimes allowing them to input information direct, job centres, citizens advice bureaux and social services on the content of such services. Most services of this kind are simply of rolling text but some companies are beginning to explore moving to an interactive teletext format to make information more readily accessible.

(b) Near-video-on-demand (NVOD), which are entertainment services, typically films, utilising digital compression in a way that gives the viewer the illusion of the kind of choice associated with video-on-demand. These services are not yet available but should be in 1997, one of the preconditions being the availability of reasonably priced decoders for the home, receiving signals either direct from a satellite or over a cable system. Such services would work by allocating a large number of channels (perhaps one or two hundred to the showing of a smaller range of films (perhaps 15 to 25), each film being shown continuously on several channels with different start times. A viewer deciding to watch a particular film at a particular moment would never need to wait more than a few minutes before the start of the film on one of the channels.

(c) "Interactive television", which uses a similar scheme of devoting several channels in order to give the viewer an illusion of interactivity. One application, which has already been implemented as part of the Videotron's interactive television cable services, is to give the viewer a choice of camera angles or his or her own instant replay when watching coverage of an event. This is achieved, in Videotron's case, by switching between four channels, one of which might carry the full field of play, a second a close-up of the action, a third the action delayed by 10 seconds and the fourth background information on match statistics, players' history etc. The same technique has been applied to news bulletins (which story is the viewer particularly interested in?), to advertising (which Ford advertisement is of most interest—for the Escort, Mondeo or Granada?), to games (with multiple choice answers followed through) and other applications, Videotron has a programme for developing the possibilities.

(d) Video-on-demand (VOD), a service which is much more demanding in technical capacity and sophistication, enabling individual access over a network to particular films or television programmes held on a computer server at a remote location. The viewers' use of the material is then under their individual control, with the ability to pause it, fast forward etc. The ITC has granted licences for four experiments of this kind, by Cambridge Cable and Online Media in Cambridge, by BT in Ipswich and Colchester, by Westminster Cable and by Video Networks Limited using the Kingston Communications network. Given the expense of the technological requirements for such services, there is a question about whether the viewers' preparedness to pay will make them viable.

(e) Interactive services generally. The trials in Cambridge and Ipswich and Colchester, referred to above, are exploring consumer services of a much broader kind than simply video-on-demand. The same technical solutions permit the viewer access to a wide range of information and services, covering recreational, educational, commercial and transactional areas. A number of service providers are partners in the trials.

(f) High-speed Internet access. A different avenue is simply to recognise the enormous range of information and services available on the Internet and to seek to overcome the difficulty and frustration involved in attempting to access it. Several of the ITC's cable licensees are introducing or exploring their own Internet access services and the current development of high-speed cable modems, using the broadband capacity of cable systems rather than their present telephone lines, could transform the use of the Internet.

(g) Advanced multimedia services. Other trials, perhaps most notably the Gemisis project by Nynex in Salford, are seeking to explore how advanced broadband networks can effectively be utilised for providing innovative services in assisting the education, health and police services, local authorities etc.

17. The ITC considers it useful to offer this brief overview of the kinds of services being offered or explored by its licensees but, not being involved directly in them (other than being a participant in the Cambridge trials as outlined in paragraph 27 below), assumes that relevant details have already been put before the Select Committee.

TELEVISION PROGRAMME SERVICES

18. Since the Broadcasting Act 1990, the ITC has been responsible for licensing television services provided to the public by means of satellite distribution (where uplinked from the UK) and by means of distribution over telecommunications systems generally. The Act assumes that there is no need to ration the number of such licences or otherwise to erect obstacles to such licences being obtained. The object of licensing is to ensure that appropriate regulation is applied to the content of such services, and that other statutory objectives, such as fair and effective competition and restrictions on ownership and control, are met.

19. Section 46 of the 1990 Act provides the licensing regime for what are called licensable programme services, which are television programmes sent by means of a licensable telecommunications system for reception in two or more homes, whether that reception is sumultaneous or at different times according to requests made by different users of the service. It is therefore clear that Parliament wished explicitly to embrace video-on-demand and interactive television within the licensing regime, whereas a number of other jurisdictions throughout the world are currently debating whether or not video-on-demand should be subject to broadcasting-type regulation.

20. The ITC is consequently required to impose on video-on-demand and similar interactive service the consumer protection provisions mandated under section 6 of the Act. The ITC does not however consider that this necessarily means subjecting such services to the same form of regulation that is otherwise applied to traditional television channels. There are clear differences in the nature of such services which make such uniform treatment inappropriate. Where a service consists of various elements (say, "programmes", advertising material, home shopping segments etc) to be accessed according to the will of the user, the idea of limiting advertising or home shopping to a specified number of minutes in an hour or hours in a day becomes irrelevant, in a way that preventing unacceptable or misleading advertising does not. Regulation needs to adapt.

21. The ITC has already decided, and publicly announced, that for services of this kind—at least on an experimental basis for the time being—the protection of children can be achieved in a different way. With a normal linear television channel, restricting access by children to unsuitable material has required clock-based watersheds, as in the Family Viewing Policy for programmes transmitted before 9 pm. Where viewers are accessing individual programmes as a matter of choice and where appropriate security mechanisms exist in relation to that choice, such as the use of a PIN number, the ITC has agreed to such arrangements displacing clock-based watersheds. In other words, an adult could choose at any time to watch a film or programme which was regarded as not suitable for children. The current video-on-demand trials are taking advantage of this modification of regulatory practice.

APPLICATION OF REGULATION TO INNOVATIVE SERVICES

22. As new possibilities present themselves, questions constantly arise as to the limits of licensability and liability to regulations. One important question, for example, concerns services over the Internet and those which will steadily be developed as the capabilities of the Information Superhighway increase. It needs to be noted in this context that the 1990 Act narrows the applicability of the licensing requirement in three ways, two rather more explicit than the third. First, it provides that it does not apply to services which consist wholly or mainly of non-representational images. This seems designed to limit regulation to pictures (whether moving or still) and to exclude text. Increasingly, of course, the opportunity is taken to enhance text services

with pictures, and it will be a matter of judgement when a service ceases to be "mainly" of non-representational images.

23. More generally, the provisions relate to "television programmes", of which there is no further definition other than the exclusion described in the preceding paragraph. Intuitively, pictures on a screen do not necessarily constitute a television programme, although there seems to be no reason to conclude that whether pictures appear on a television screen or a computer screen makes a crucial difference. It is far from easy, however, to determine, as new services develop, what is and is not a television programme.

24. The third exclusion at least helps to identify one area which it is not intended to cover. The Act provides that licensing is not to apply to any service of which an essential element is two-way communication, other than where the "upstream" communication consists simply of signals to control what is sent downstream (as in video-on-demand, for example). This plainly takes out of the licensing net video conferencing and video telephone conversations, although probably not the use of a videophone to dial into a recorded service (which would appear to be indistinguishable from video-on-demand).

25. No application for a licence has yet been made to the ITC for any Internet service. Although services on the Internet are burgeoning, and developing in sophistication, few people are likely yet to see them in terms of television, to which regulation by the ITC is appropriate. But future developments might be different. At least the statutory mechanism exists to apply content controls to new services which are perceived, by Parliamentary and public opinion as well as regulators, to be of a nature calling for broadcasting-type regulation.

Technical Research and Development

26. The Broadcasting Act 1990 enables the ITC to carry out technical research and development work, by subcontract, in consultation with its licensees. The areas targeted in this work are typically of interest to a range of different licensees (or prospective licensees, as in the case of the work on digital terrestrial television), and are on a medium to long timescale. One of the ITC's main interests in this field is to encourage the development of a wider range of services for viewers through new applications.

27. There are two current projects which are of particular relevance to the information superhighway. The first is a European collaborative project managed by the ITC known as INTERACT, which is assessing and in some cases developing return-channel technologies for all transmission media. In this way interactivity using terrestrial broadcast networks will be developed. The second is the Cambridge interactive TV trial, within which the ITC is investigating the specific needs of the elderly in operating interactive systems, instant access teletext systems, the use of subtitling text for navigating programme content and issues concerned with local news production. Further information can be supplied to Select Committee Members on these projects if desired.

A need for new regulatory structures?

28. The question is often posed as to whether the dramatic changes which are in train in communications necessitate the reordering of regulatory arrangements. Such questions are sometimes raised in the context of discussion of the extent to which television channels as we have known them will within a few years be replaced by the ability of viewers to use the Information Superhighway to call up the information or programmes of their choice, at the time of their choice. The "tyranny" of the television scheduler will disappear and indeed the whole concept of "broadcasting" would evaporate.

29. While recognising the significance of current technological developments and the likelihood of new forms of service being made available to the public, the ITC believes the pace of change to have been exaggerated. Broadcasting as we have known it, including the channels distributed by satellite and cable, will undoubtably continue well into the future, even if supplemented by new ways of accessing material. In these circumstances, it seems to be wrong, and indeed dangerous, to set aside the assumptions which have underpinned the regulation of broadcasting in favour of those which, speculatively, might relate to future ways of providing services. Broadcasting is a distinct and important activity, economically and socially, and it would be premature, before a clearer idea of the future is possible, to contemplate fundamental change in the way it is regulated.

Conclusion

30. The ITC, as a regulatory body, has in this paper addressed these matters within the Select Committee's enquiry which have regulatory implications. Many of the Sub-Committee's questions lie outside the

responsibilities and interest of the ITC and have not been addressed above. But the ITC would be very happy in oral evidence to elaborate on the paper to the best of its ability.

Independent Television Commission

23 May 1996

Examination of witnesses

Mr Jon Davey, Director of Cable and Satellite, and Dr Nick Lodge, Head of Standards and Technology, Independent Television Commission, called in and examined.

Chairman

905. Good morning, Mr Davey and Dr Lodge. Perhaps you would like to introduce yourselves and then make any introductory statement that you think might help us.

(*Mr Davey*) I am Jon Davey. I am the Director of Cable and Satellite at the Independent Television Commission which means that my responsibilities cover almost everything that is not terrestrial television, meaning that I get involved in all kinds of new services as well as the cable infrastructure that is now being put in through our local delivery franchise. I have with me Dr Nick Lodge who is our Head of Standards and Technology and therefore, as an engineer, will be well placed to supplement anything that I can say to you. I am not sure that there is any introductory statement that I would wish to make. We have submitted a memorandum and I would be very happy, if that suits the Sub-Committee, simply to take questions on what we have said.

Baroness Hogg

906. Perhaps I could start with asking you about how you think the ITC's remit should be changed to take account of the convergence of telecommunications and entertainment, for example by a merger of ITC and OFTEL. That is a polite way of saying is there any justification for your continued existence?

(*Mr Davey*) Our view for the time being would be that it would be premature to consider radical changes in the regulatory structures. I think that is partly because we do not yet see the effects of convergence as being at all clear and that probably the whole idea of convergence needs looking at a little more critically. It does not, for example, seem to us to mean that broadcasting and telecommunications converge together to create one single entity that is new in such a way that it is then very difficult to separate out the constituent elements, so that we no longer have anything called "broadcasting" which can be dealt with separately. It does seem to us that we are likely well into the future to have the continuation of the kind of television broadcasting services that we know and understand today. Moreover, it does seem to us that television has always been regarded as a subject of such importance to justify its own scheme of law, its own regulatory structures and that that is not going to change in the foreseeable future. We, therefore, I think, would find difficulty in seeing a benefit from the merger of the ITC and OFTEL. Indeed, we would see some disadvantages because while we would accept that in many ways broadcasting can be seen as a particular kind of telecommunications activity it is very much a distinct, and we think an important, subset which still justifies a separate scrutiny, and there is always the danger, I think, that if you wrap together two organisations something gets lost along the way. We recognise, of course, that the world is changing but it does seem to us that it is changing really at the margins and that the difficulties that we are moving into with convergence mean that the edges of what we do as television regulators are becoming blurred. We are, for example, faced with new programme services and new ways of providing services (which might sometimes look like television, sometimes you are not very sure) but the Broadcasting Act, as Parliament has now legislated—and I do not think the current Bill going before Parliament will alter this in any dramatic way—does contain a definition of broadcasting which caters for changes in the future. It caters very specifically, for example, for video on demand which is one of the new services that we do see happening: that has been very definitely identified by Parliament as something which ought to be regulated as part of the ITC's television responsibilities. So, in short, we think that one would need to keep an eye on what happens in the future as things develop, and as one gets a clearer idea of the directions in which they might develop and the kind of ends to which we might be moving, before one reaches any conclusion about changes in the regulatory structure.

907. As you say, the edges are becoming blurred?

(*Mr Davey*) Yes.

908. And new services are being delivered outside your remit that look in some cases very much like broadcasting. For how long do you think the present regulatory framework is viable?

(*Mr Davey*) I do not see at the moment a time in the next few years when the present regulatory environment would be inappropriate. I do see that large body of television broadcasting continuing well into the future. What we have to do, I think, is to wrestle with how television regulation is applied to new kinds of services which do develop at the margins and some of those will clearly fall within our responsibilities. Others I think may well fall outside our responsibilities and others may give rise to considerations which we, or indeed Parliament, may have to address in the future in the next few years, but I think our regulatory structure is fairly robust for the time being.

909. One type of service of course that could grow quite fast at your end of the street, if you like, television, could be forms of television commerce and electronic commerce through the television channel. Who should be responsible for consumer

Baroness Hogg *contd.*]

protection of those? Yourselves or the Independent Committee for the Supervision of Standards of Telephone Information Services?

(*Mr Davey*) We have a definition in the Broadcasting Act of what the ITC is to concern itself with and that essentially relates to television.

910. I am talking about the television end of things.

(*Mr Davey*) And one can see things beginning to develop. Certainly we and ICSTIS have had discussions about things which seem to be happening in which we both have an interest. Therefore, I think it is going to be impossible to say now where the line should be drawn.

911. Someone is going to have to say it.

(*Mr Davey*) Some things fall on the television side of the line and are seen to fall on that side of the line; other things appear to be the concern of ICSTIS, but then not everything will fall into one of those two groups. There may well be other things that are not regulated by either of us at all. After all, we happily accept that many kinds of service are not subject to public regulation. The printed media, by and large, of course are not subject to those forms of regulation at all and when we are looking at the kind of services that can appear on a television screen a lot of that may be text. Text so far has been regarded as falling on the side of the line which says it is no different from the printed media and therefore we need no additional forms of regulation.

912. That seems to be an argument for reducing regulation and again an argument for getting rid of ITC's responsibilities.

(*Mr Davey*) We have heard for some years now the arguments that as television services become more like the magazine rack there may be a diminishing need for regulation. I think counter to that there has always been the assumption that the power and the impact of the television medium does require some kind of regulation over and above that which we have always applied to the written word.

Lord Gregson

913. You say that many of the changes are occurring on the margin but is it not true that technology is changing right down to the core. Digitalisation, the fact you have now got cable expanding their telephonic services at five times the rate of their television services. There is a hell of a mish-mash in the middle. It is alright talking about having television as your basic activity but in fact hard wire connections are going to be just as important, if not more important, in those circumstances and you cannot have two regulators, can you? What a mess if you do.

(*Mr Davey*) We have two regulators—

914. You have probably got about five.

(*Mr Davey*) There may well be more regulators than we need, I think, and it may sometimes cause some confusion, but in relation to, shall we say, the distinctions between television and telecommunications, yes it is certainly true that we have cable operators who are in the business of telecommunications and who are in the business of relaying television, but I do not think that points necessarily to a single regulator. Those activities are very distinct. We know what television is. They know that television is subject to one form of regulation which is not appropriate for the provision of telephone services. So I think the mere fact that technology is changing does not necessarily mean that the regulatory structure is inappropriate. Whether we have analogue or digital transmission, whether we have terrestrial or satellite or cable transmission of television services, what you need to be concerned with is what you see at the end. Is it television or is it something quite different?

915. You have already mentioned things like television on demand. It is well recognised at the present time that the best way of delivering this is partially through whatever system you want to do for television and the selection system being hard wire. Whether it is broad band or cable does not matter. So you have already got mixed services. The same applies if you have got text on the screen. Some text and some moving picture bases are becoming more and more common. More than 50 per cent of the text on Internet is mixed text and database. We cannot draw that distinction any more.

(*Mr Davey*) It is becoming increasingly difficult. That is why I referred to the blurring at the edges. But it does seem to me it is only the edges of our responsibility.

916. It will not be at the edges of your responsibility if technology moves at the pace it is moving at the present time. You will have digital television guaranteed by the autumn of this year, six months from now. That is not blurring at the edges. That is going to kick it right up the backside.

(*Mr Davey*) I am not sure whether if television is transmitted digitally makes a difference to television. Where I do see blurring at the edges is Internet where we can ask whether the Internet is television or not. That is where you begin to have to ask difficult questions.

917. Is electronic mail television?

(*Mr Davey*) There are a lot of very difficult questions as these new forms of service begin to develop on the margins of what we have so far called television or telecommunications. If you look at the core of the ITC's responsibility, which is television, we see that core as not unchanging but as much more stable and likely to continue for a long time to come.

918. The next major hardware change will be the simple computer device now being called network computers which will bring the cost of going on to Internet down to a fifth of what it is now. That merges very directly with television. You just stick a box on top of your set and away you go. Technology is going to happen very rapidly.

(*Mr Davey*) Technology is happening very rapidly and we certainly understand that. That is why we do have to wrestle with these issues of what happens on those edges where those edges are being blurred. As our memorandum said, we have been approaching some of the issues of how we regulate different kinds of services, so the mere fact that something is regarded as television does not mean in our view that it should be regulated in the same way as the television that we have known in the past.

Lord Gregson *contd.*]

Lord Gregson] Is there not a touch of Canute about this? The tide is coming in rather fast, is it not?

Lord Flowers

919. What is the cart and what is the horse in this game, if I may interrupt you rather rudely. It sounds to me as if the convergence is being held up by the separateness of the regulatory regimes. It might happen a lot faster if the two regulatory regimes were combined.

(*Mr Davey*) I do not see a respect at the moment where development is being held up because of regulatory difficulties.

920. You are talking about at the edges all the time when we know jolly well it is at the centre.

(*Mr Davey*) It depends what you are looking at. If you are looking at the Superhighway these developments are obviously at the centre of issues about the Information Superhighway. I was looking at the issue of television broadcasting and saying if you look at that, that is fairly stable and it is likely to continue for a long time to come. What we are likely to see is new things tagging on around the edges.

Baroness Hogg

921. Do you really think it is stable? Do you think that the broadcasting picture in this country is stable?

(*Mr Davey*) Well, what—

922. The number of channels is increasing rapidly. The ITC system designed for a small number of channels is going to be tested by the development of a large number of channels. I do not want to pick you up on one word but it seems to me a strange image.

(*Mr Davey*) We have been used over the last few years to coping with a lot more channels. What I was suggesting is that that is all television. Television is expanding certainly and it will continue to expand as we have digital satellite and, following that, digital terrestrial transmission. That does not alter the concept of what is television.

Lord Craig of Radley

923. Does it not all depend which end of the telescope you are looking through? You are looking through one end I understand because that is your responsibility and that is your remit. Looked at from the customer end of the telescope it is getting much more difficult to see that he is going to be able to distinguish, other than perhaps in a marginal way, between who it is actually providing the content of his entertainment. It may come through networks, it may come through Internet or it may come through broadcasting. He is going to be receiving a whole variety of things which are beginning to lose the distinctions which history has landed us with. In that case, if we were starting with a clean sheet of paper on a regulatory regime, would you not perhaps be thinking, on the one hand, of universal access and the importance of the responsibilities you have for that (that applies both to telecom and to television and to every other digital multi-media that are coming to pass) and, on the other hand, the very important issue of content. Again, it does not matter whether it is content by broadcasting or content by Internet and so on. Recognising, of course, where you come from and therefore why you must defend the ITC, would you like to imagine a regime where you were starting with a cleaner sheet of paper with what we now know about the digital world.

(*Mr Davey*) I did not come here with the intention of defending the ITC's position. I am seeking to look at this in the light of the reality of what we see happening. I think if we were starting with a clean sheet of paper one would certainly say there is a confusing picture and we do not quite know what the world is going to look like in five years' time or ten years' time. But there is something there which is television on a screen (it may be a computer screen, it may be a television screen) on which there is a consensus view in political and public circles that a certain kind of regulation is needed. I think, therefore, that you would come to a view that a distinct form of regulation is needed for something called "television".

924. Yes, but would you like to expand on what the regulatory issues might be rather than saying—I accept that there must be some regulation but regulation of what?

(*Mr Davey*) I think that one of the important issues still, and I think it will be for the future, is in terms of a public service in broadcasting. This, of course, is embodied at the moment in our terrestrial television channels. They are the services which go to almost everybody in the country and on which those people depend for a public service of high quality, diversity, a balance of education and information and entertainment. Whatever else may be happening—and we recognise that there are a lot of new choices becoming available, whether through cable, satellite or the Internet—most people in the country for a long time to come are going to depend on that core service of public service broadcasting. I do not see the changes that are happening in terms of the Information Superhighway as diminishing the importance of public service broadcasting over the next ten or 20 years.

Lord Hollick

925. I think you have just put your finger on what is the distinctive issue as far as the regulation of existing broadcasting is concerned. The ITC is interested in content not just the award of licences. They are interested in what is shown on television. That becomes an increasingly relevant role in a world where there are many means of delivery, satellite, maybe digital terrestrial, certainly cable, for many many channels. I am struggling to see how that distinctive role for the ITC is carried into the future. Yes, there is a hangover from the past where we move from a situation where people have terrestrial to multi-channel homes. That is happening at a very rapid rate and, as Lord Gregson said, it is accelerating. The ITC, as far as I can see, has no role to play in a multi-channel environment other than standards of taste and decency. If you take that role away from the ITC you are not dealing with the

Lord Hollick *contd.*]

margins; you are actually dealing with the core of its purpose. Therefore, I cannot see what its role is at all.

(*Mr Davey*) I think there are, if I may answer that Lord Chairman, two concerns that we would have in relation to the multi-channel world. One is the issue of content, as Lord Hollick has said, regulating in the interests of protecting the consumer, taste and decency, misleading advertising, violence and all those other issues. We also have, as we see it, an important role in relation to fair and effective competition in the provision of services. That is an issue we do have on our plates at this moment and I think that will continue to be an important issue but I do not see the growth of the multi-channel world as really diminishing the importance of that other public service element of our responsibilities for a long time to come. We have the situation now (and I think it is going to continue for a long time) where multi-channel television is taken by only a minority of viewers in this country. And if you ask the question when might it be taken by a majority, then I think that is likely to be some time away yet. Therefore, we do see the importance for large numbers of viewers of preserving the public service elements in broadcasting as important for some time to come.

926. Your own forecast has shown that penetration of multi- channel homes will reach 50 per cent in the next decade.

(*Mr Davey*) We have never made forecasts of what the take-up would be. We do have forecasts of what the availability might be. It is certainly true that we see cable television, for example, becoming available to most of the population within the next few years. Current experience, of course, is that the proportion of people to whom it is available who actually take the service is not much more than 20 per cent and, of course, for satellite television, which is available throughout most of the country now, the take-up rate is rather less than 20 per cent. So we do have a large part of the population now, and I think for a long time to come, reliant on terrestrial television.

927. You do accept though that the role of the ITC in monitoring content is going to be less relevant in a multi-channel world with hundreds of channels?

(*Mr Davey*) We do see it as an important part of our role. It is a slightly different role because we are not concerned with imposing the positive obligations that we see going with public service broadcasting, but the role of consumer protection even in a multi-channel world is one which most people would wish to see continue. I recognise there are arguments going the other way but they tend to be arguments that do not carry a lot of weight in Parliament or in the popular press.

Baroness Hogg

928. You mentioned competition issues. It seems to me in defending the role of the ITC that is possibly your weakest case. There are other authorities involved with competition, OFTEL if not OFT. What we are struggling with is to define this public service. If I could follow Lord Craig on this, to help you make your case in the new world (and I am still not sure it exists) there are issues in relation to new services, Internet services, any kind of new services, which relate to the question of public service much more broadly defined. Some of your descriptions of public service I found slightly odd and they sounded to me like descriptions of the BBC, whereas the remit of the ITC, as I understood it, is not to ensure that there are other channels of public service broadcasters but to ensure that the broadcasters out there provide certain public service content on their channels. There may be some issues in relation to new services where this same principle should be developed. Lord Craig, for example, mentioned the issue of access which is an important concomitant of public services. Is there not a collection of those kind of issues which are suitable to be located in a single authority of the OFTEL kind and therefore make an argument for some kind of public service citizens' watchdog type regulator of new services which might ensure a continued role for the ITC?

(*Mr Davey*) I am sorry if I gave the impression that what I was talking about was confined to the BBC. We do have, I think, responsibilities for ensuring that both the ITV companies and Channel 4 provide what is generally regarded as a public service and there are lots of positive obligations in that respect.

929. That was the point I made.

(*Mr Davey*) You mentioned then the question of whether there could be particular responsibilities for, shall we say, a single regulator, and you mentioned OFTEL. I think that other countries, of course, have coped with single regulators but you often find even though there may be a single body, what happens within that body is entirely separate.

930. I obviously phrased my question badly. What I meant was is there a role for continued distinct public service regulatory bodies, a future ITC, separate from a single regulator of the OFTEL and OFT kind?

(*Mr Davey*) I think I would answer that by saying the disadvantages it seems to me of having a single regulator of the OFTEL kind, or whatever it might be called, is that the issues relating to public service in broadcasting that we have been talking about do get rather submerged by lots of other issues relating to telecommunication. Telecommunication, by and large, is a much bigger business than is broadcasting and the issues in relation to telecommunications are complex and considerable but they are entirely different issues from those which relate to broadcasting. You could put all those responsibilities within a single body. No-one is denying the possibility of doing that. I think what we would say is because they are distinct issues it does make sense for distinct regulators to be dealing with them.

Chairman

931. We have spent quite a lot of time on that question, which is a rather important one, and the thought occurs to me if it is content you are interested in, of course, when we are talking to people about what might be transmitted on the Internet, content becomes a very important issue. For example, the recent enactment in the US Congress of a bill imposing censorship on the Internet has recently been declared unconstitutional by the Supreme

Chairman *contd.*]

Court. It seems rather strange perhaps that content in that context should be treated quite separately from content in your context.

(*Mr Davey*) I think you have to look at what content means. What we are concerned with by and large is television content. So far I think the Internet has contained little of what most people would perceive to be television. Yes, there is an increasing amount of pictorial matter there. It is accessed very slowly. Real time video is not really an issue at the moment, although real time audio is becoming more practicable. And that is why I did emphasise that we have been looking at this for a little while. We do recognise that as the Internet develops it may well embody services which are regarded as television and which could therefore be regulated as though they were television. Lots of difficulties relate to that. One of them, of course, is the international nature of the Internet. As a sheer matter of practicality, regulation becomes much more difficult, as we have found of course to some extent already with satellite television. That is why we have had in the European context European agreements between the Member States of the European Union and of the Council of Europe to take a common approach in many respects towards television regulation. Perhaps, as time goes by, European agreements of that kind will not be sufficient. One has to move to a more worldwide context but that would be, of course, against the background and on the assumption that regulation of some kind was still considered appropriate. I cannot quite see that people would be happy to say if there is something very much like television appearing through the Internet we will not apply the normal expectations of regulation to services of that kind. Most of the Internet so far has been text based and, as I said before, text services have been regarded more like the print media in that you do not need public regulation for that.

Lord Craig of Radley

932. Are you not being somewhat dismissive about the growth potential of the Internet and the Information Superhighway? The technology is there or about to be there. We are getting more and more digital information in quite large buckets down twisted pairs, and so the development is all there. You seem to be suggesting that it will be possible to identify within this mass of material that which is television and that which is not. I believe that the boundary between those two is going to be extremely difficult to identify and unless you can identify it you are standing on rather flaky ground. So what is the answer then? If you take the assumption that technology is advancing in leaps and bounds—we can have an argument about the rate of take-up but there is a perception that there will be a considerable take-up into this multi-media world—you are responsible in ITC for television content and regulation. You appear to be suggesting that even in this new multi-media world there will be a differentiation between the two. My suggestion is they are going to be scrambled up. What means do you have for identifying the one from the other?

(*Mr Davey*) I do not think it is quite as difficult, my Lord Chairman, as Lord Craig suggests. We are not looking at the stream of what is transmitted, looking at all these digits and trying to work out what is data and what is speech and what is pictures. We are looking at what the consumer receives and in those circumstances it is much easier to say that this is television. Whatever that jumbled up stream of transmission might have been it ends up on somebody's screen as a television picture and therefore the person who was providing that needs to be regulated as a provider of television.

Lord Gregson

933. Do you realise the impossibility of monitoring that? It is outside the bounds of all possibility to monitor it. If you cannot monitor it you cannot regulate it.

(*Mr Davey*) One of the other problems certainly with the Internet is not merely the fact that it is international but there is so much of it.

934. It is recognised to be impossible to monitor it so how can you regulate it?

(*Mr Davey*) Would Parliament be happy, I wonder, to say that it should be free of regulation?

935. We are talking about international regulation. You realise that the court case in America struck a fatal blow to international regulation. All of the regulation in the States is voluntary. All you can have is a voluntary code: "I pledge that I will not put on this network one of the 600,000 transmissions going out at the moment that violate that code." It is a nonsense, is it not?

(*Mr Davey*) In relation to services which originate in the United States there is, of course, the First Amendment of the Constitution which severely restricts interference with freedom of speech. That is a problem that we do not have because we do not have a First Amendment on this side of the Atlantic.

936. We have one on the other side of the Channel.

(*Mr Davey*) There is of course a strong international consensus in Europe that television should be regulated.

937. But nobody knows how to do it.

(*Mr Davey*) We have needed to tighten up our own regulation in the United Kingdom to take account of the European Union Directive.

938. When you have got two channels or six or ten channels on cable there is a possibility of doing that. Once we have got Internet with all the range of services digitised so you can have moving pictures to your heart's content and television to your heart's content it becomes impossible.

(*Mr Davey*) It may be in the future that the pattern of television services available to the public will be in that form and when that happens it may be that everybody gives up and says, "Well, it is up to the consumer." I think we have got a long way to go before we reach that position because accepting that the Internet is rapidly developing and accepting the technology and the take-up, I think there is nevertheless going to be a lot of television, as we

Lord Gregson *contd.*]

indicated earlier, that is going to continue to be in a more traditional form.

Lord Gregson] Can I remind you how quickly the Walkman overtook the whole of the world.

Chairman] It seems to me, Mr Davey, the Committee may think that the future is more imminent than you do. Having said that, we should probably move on.

Lord Haskel

939. Lord Craig raised a question on universal access and you told us about your commitment to universal access. Given, as you say in your evidence, that small towns and villages are not economic for the franchise, how are we going to include these people into universal access and should BT be allowed to operate a local radio loop service which is probably the cheapest way of including them in?

(*Mr Davey*) Can I say that in relation to the country as a whole, it may well be extremely difficult to embrace many of those who live in rural areas within the availability of the kind of services that we have via broad brand cable. Our franchising process is trying to find as much of the country as possible that can be dealt with in that way. It may be, I think, that thereafter one has to say, "What existing networks are there in the areas concerned?" And usually in most areas there is the telephone line anyway and one could change the rules to say, it is proper to stop the franchising process and to leave those other areas to be served perhaps by BT. I am not quite sure exactly what technology you had in mind when you were talking about the local radio loop. At the moment of course the government has allocated certain frequencies for the distribution of television to the home by what is called MVDS. It is the 40 Gigahertz band. That is available to anybody who obtains a licence from us. If BT wish to provide services of that kind it could seek licences from the ITC to do so. The use of other frequencies for that purpose might be more problematical. That would be a matter of decision for the government about making other parts of the spectrum available to provide television to the home.

940. It is as much a question of economics as technology. If, as you say, the BT cables are in there would you visualise BT having the right to transmit the services which are provided by the cable operators via their twisted pairs?

(*Mr Davey*) I would envisage that as a matter of regulation. It is then a case of what is possible via that technology, how economic it is going to be to make the investment that would be necessary to use those telephone wires.

Lord Hollick

941. You stated earlier that the promotion of competition was one of the objectives of the ITC. It seems that the provision of cable services to the home is an area that would benefit from competition. That is how I would see it as a consumer, if I may introduce a personal note, and yet you have supported a view that BT should be prevented from competing until 2001 notwithstanding the fact that many of the cable franchises will be more than ten years old by that time. Surely a bit of competition in the local loop in the provision of cable would be beneficial to the economy and beneficial to the consumer?

(*Mr Davey*) I think the big problem there is that the economics of the cable business are still subject to some question marks, albeit fewer question marks today than in the past. The slow development of the cable industry in the past has been because of substantial doubts by investors on the return to be gained from that investment. And in those circumstances it has seemed to us that premature competition in the provision of cable television services would be damaging to the confidence which is currently leading to a massive investment in broadband cable systems, an investment currently meaning that two million homes a year are being newly passed. All that investment is being made on the basis that those operators have the right to compete with BT, or indeed anyone else, in the provision of telephone services and for the time being have exclusive rights in their area to provide cable television. Now there is always a question, I think, as to how valuable an opportunity anyone else like BT would regard providing cable television in competition with a cable operator, but I think there has been a very substantial danger that if you said to BT, "You may now compete with cable operators", that would diminish confidence to the extent that the remaining cable systems would not be built according to the current timetable. Bear in mind, of course, that the construction of cable is less than half done. There is a lot of investment to come over the next five years, another ten million homes to be passed, and I think the enormous investment that that requires does, in our judgment, justify protection for the relatively short term. We are not thinking long into the future, but there needs to be protection in the meantime from competition by other providers such as BT.

Lord Gregson

942. Given the advance of technology, does it matter that those cables are not put in? Some people would argue that technology has overtaken it and therefore we are just flogging a dead horse and spending a lot of money which will be never be recovered putting cable into the ground which is not necessary?

(*Mr Davey*) Whether there is money to be recovered from that investment I think is a judgment.

943. The investment has not been made yet, the cable is not installed.

(*Mr Davey*) There is an enormous investment being made on the basis that there is a return to be gained from the investment. Yes, we all recognise that technology in all areas—in radio-based services as well as wire-based services—is leaping ahead in dramatic fashion. Most people, I think (and obviously this reflects the judgment of those people who are making that commercial investment at the moment) is that it is unlikely that radio based services, given the constraints on the spectrum, could compete with the sort of capacity which optical fibre

Lord Gregson *contd.*]

in the ground can provide but it is a commercial judgement that is being made.

944. But it is not a commercial judgement. You have the law on your side, "thou shalt not ..." That is not commercial. If it was commercial, cable would have stopped some time ago. It is only because they are guaranteed a return on their money that they are going on installing cable. If it was a perfectly competitive situation it would have stopped.

(*Mr Davey*) If it was a perfectly competitive situation one wonders what else would be happening.

945. British Telecom would be developing their service to start with. A radio connection would be developed.

(*Mr Davey*) I would be reluctant to accept that. It does seem to me that what has happened over the last few years has given to new operators the opportunity to come into a market and to move quickly, as quickly as possible (and certainly in the early days it was not as quick as we wanted) to build new networks. It seemed very unlikely to us that the same incentives would apply to BT if it was free to make that investment. If the economics of cable operators providing new networks are uncertain, I think that the economics for BT, who after all already have telephone networks everywhere so they do not have that particular part of the business to encourage them, of installing new networks for the sake of cable television are very doubtful. It is a matter for BT but my perspective would be that the regulatory environment we have at the moment is encouraging the construction of broadband networks rather than holding it back.

Lord Gregson] BT actually say something different. You are plugging away in holding the *status quo* of lack of competition and providing a return.

Chairman

946. Is it not at least arguable that the cable companies have so far failed to identify services other than telephony which people are prepared to pay for over their system and that if BT were able to enter the market and devise services that the public might wish, that that would actually help the cable companies to get into a more profitable line as well as telephony? I leave that in the air and suggest that we might at that point go on to ask you about the Cambridge trials.

(*Mr Davey*) If I may, I will ask Dr Lodge to address that particular subject.

(*Dr Lodge*) My Lord Chairman, if I can give a little bit of history to do with our involvement in the Cambridge trials. I run on behalf of the licensees of the ITC a large research and development programme which explores new technologies which are of benefit to our licensees. One of the things which we are very interested in is the technology developing around inter-active television. The infrastructure which is being established in Cambridge and the trials which are running there seem to be a particular use of infrastructure on which to run research and development experiments. So we have now set up four projects, if you like, around the Cambridge trials looking, for example, at the influence that inter-active television will have on elderly people, whether they are able to use the navigation systems and so on. We are doing that in collaboration with On-Line Media who operate the Cambridge trials, and Manchester University. We have other projects which we have been running with the Teletext provider in the United Kingdom to provide instantaneous teletext on the Cambridge trials and that has links to the Internet as well, a unique facility. All those facilities we have provided to the Cambridge trials are going extremely well. I have to say, since you ask what we have learned from our involvement in the Cambridge trial, the Cambridge trial has perhaps been going a little more slowly than we would like because there is not enough money to support it. It is run very democratically by a group of so-called service nursery providers, each company providing their own services on the server in Cambridge, and that is run on a subscription basis. But we have nowhere near the amount of money that British Telecom has been able to invest in the Ipswich trial, and the upshot of that has been that the shopping services which we hoped would be started by now are a little late but will be starting soon, and we have not been able to afford in general to buy film rights to show interactive movies on the service. I do not know how much British Telecom would have spent on movie rights or interactive television rights on their Ipswich trial, but I would guess it is a substantial proportion of the amount of money they have invested. So as a member of the trial that is a little disappointing for us, we would like to be able to provide to people in Cambridge the whole gamut of services which they might expect to see on interactive television in the future. The trial is relatively young, it is still growing, we are now supplying about 100 homes covering 250 people, and there are also two schools involved in the trial. It is, for its scale, very, very successful. We get regular reports on the statistics and are very encouraged about the way things are developing around the trial. Of course, the key to all this is the economics of interactive television and all the members involved in the trial are keen to study the economics of the provision of these services. They are using advanced transmission technology, there is optical fibre to the street cabinets, and the final path between the street cabinet and the home is along co-axial cable, much as cable television is delivered now. The economics of being able to use existing ducts of course has been proven in the Cambridge trial to be significant; the ducts are already there and the infrastructure and the investment which has gone into them already exists, so drawing more optical fibre along these is relatively cheap. It is a little early to say that we have learned a lot from the Cambridge trial but we have set up a lot of experiments and we are very optimistic about the way the trial is going.

947. Do you have anything to add about the Ipswich trial?

(*Dr Lodge*) We are not involved in the Ipswich trial, and my impression is that BT have kept it shrouded in secrecy a little since it is of commercial value to them, and I would expect them to do that. Although I have been there and I have seen it—and it is very exciting—I cannot really comment on some

Chairman *contd.*]

of the successes. I look forward to the opportunity of seeing some of the presentations which will be coming out of the trials. On the technology front there is one comment I would make, and that is using the telephone line the way it is being used for transmission limits the capacity. It may only be a short-term limitation until BT can put optical fibre to the home, but it does limit the capacity to 2 million bits per second of information and the picture quality you can deliver at that level is only of the level of a video recording, a VHS sort of quality. I wonder privately whether in the future consumers will be happy with that level of quality when they are getting something like three times the digital capacity available from digital terrestrial TV or digital satellite. This is a fundamental physical limit of the telephone line transmission, it is not physically possible to get more capacity down the telephone line given the distance between the average telephone exchange and the subscriber. One of the advantages of the Cambridge infrastructure is that there is not this limit to the bit capacity and the quality of the television pictures you can deliver, so in principle the interactive movies and things you can deliver will be of a competitive quality with those which can be delivered by satellite.

Lord Gregson

948. On the basis of defence technology, message compaction is moving very rapidly indeed, and that might not be a restriction for very long once it is digitised.

(*Dr Lodge*) That is true, and compression technology has moved on remarkably. I believe it is a question of diminishing returns, and the leaps in compression technology which have been achieved over the past few years will not be repeated in the future because we are approaching the physical limitation.

Lord Gregson] Complete digitisation will make an enormous difference to that capacity.

Chairman

949. Going back to the question which I left in the air, do you think that the Ipswich trial, for example, is holding up an example to the cable companies of the services which they might be considering offering?

(*Dr Lodge*) It is certainly holding up an example. It is really a question of economics more than technology. I am sure the cable companies are looking carefully to see the kind of services British Telecom have been able to offer on their trials. There are some exciting services coming along. For example, we are working in areas of virtual reality, the kind of experiential-type services where you might, for example, visit some place as a virtual tourist you have never been before by putting on a head set, or take part in some kind of interactive games. These are exciting opportunities for broadcasters in the future and service providers. Some of those things are being explored in another trial taking place in Florida, where the computing facilities available in the customer's premises are absolutely enormous and well beyond anything we could afford in the Cambridge trial or possibly in the BT trial as well. So we need to think very widely about the sort of services which are being transmitted. If I might say one thing: these services are all moving picture services. We in the ITC will probably recognise these broadly as television, even though they do have a very wide and diverse area of application, both for entertainment and information.

Lord Craig of Radley

950. There is a Catch-22 here, is there not? Reading your evidence you say: "... installing fibre to the home will ... depend on services developing which need greater capacity than can currently be provided, which does not appear to be an early prospect." It is not the technology, you are telling me that is there; the cost is probably an issue but the cost is likely to come down, so is it a regulatory restriction?

(*Mr Davey*) It is not a regulatory restriction at all.

951. Dr Lodge holds out the prospect of these things yet your written judgment is that they are not likely to be taken up.

(*Mr Davey*) No, I think perhaps you have misunderstood what was written there. What we were saying is that most of these services Dr Lodge is talking about can be delivered over co-axial cable into the home, they do not depend on optical fibre.

952. You do not need to go into the fibre, you can do it on broadband?

(*Mr Davey*) Right.

953. So, in other words, the limitation is not that you need a greater band width in order to carry these things. I misunderstood Dr Lodge, I thought he was suggesting fibre to the home was going to be required for some of these things.

(*Dr Lodge*) Can I clarify one thing? The backbone of the system needs to convey a vast amount of information from the service provider, whoever that is and wherever they are, to the home. In the trunk which goes between the service provider and the street cabinet, we have to be carrying information for every home, but the last drop, between the street cabinet and the home, which represents investment in digging the trench to the house, would still be suitable for services in the future. Many cable operators are installing optical fibre of course in the route between their service provision premises and the street, so the facilities may well be adequate, I do not know, for interactive television services in the future.

954. My point was that you appeared to be ruling out a rapid take-up in this direction although it is happening.

(*Mr Davey*) I think the point is simply that whether that last drop into the home is co-axial cable or fibre, does not make very much difference at the moment, it is not holding back the kind of services which can be delivered. If other services are delivered in the future, or if the capacity that is required into the home, require optical fibre then the optical fibre into the home might well be installed.

Chairman

955. I am afraid that time has defeated us again and we shall have to leave it at that point. If you would like to submit any further remarks which you have not been able to make this morning, in addition to your written evidence and the brief that you so kindly gave us, please feel free to do so. Meanwhile, thank you very much indeed, Mr Davey and Dr Lodge, for your very helpful contribution.

(*Mr Davey*) Thank you, my Lord Chairman.

Supplementary Memorandum by the Independent Television Commission (ITC)

ITC RESPONSES TO POSSIBLE QUESTIONS

1. HOW SHOULD THE ITC'S REMIT BE CHANGED TO TAKE ACCOUNT OF THE CONVERGENCE OF TELECOMMUNICATIONS AND ENTERTAINMENT, FOR EXAMPLE BY A MERGER OF ITC AND OFTEL?

As indicated in the Memorandum submitted to the Sub-Committee, the ITC believes that the notion of convergence does not yet call for a change in its remit, and would not accept that a merger with OFTEL would make sense. In this context, an examination of the idea of convergence and what it is likely to involve may be timely and helpful.

Convergence appears not to mean that telecommunications and broadcasting converge together to form a single entity so that it no longer makes sense to attempt to distinguish between different kinds of service. For example, television broadcasting, as we now know and understand it, seems likely in the ITC's view to remain a distinct and important force well into the future. Whether the means of transmission is analogue or digital, or terrestrial, satellite or cable, does not change the essence in any way. In these circumstances, a merger between the ITC and OFTEL would seem misconceived. Even at the moment, broadcasting can be seen as a form of telecommunications. But it is a distinct form which is regarded as of such importance in terms of economic activity and cultural influence that it has always been seen as justifying a quite separate legislative and regulatory framework. It is difficult to see that changing as a result of what is called convergence.

Convergence, rather than leading inexorably to the removal of distinctions, is blurring the edges. Television programmes might be available to be accessed on individual demand over what used to be called a telephone network. Telephone services particularly of the kind provided on a premium rate are likely to be developed from their current audio base so that some of them look very like television. The Internet, steadily being developed in its capabilities, will increasingly offer picture, and even video material, which more people will be able to access easily and economically. These developments are likely to mean that more services fall within the definition of television which it is the ITC's remit to license and regulate. Services of this kind will co-exist with rather than displace those which are already the ITC's prime concern.

But the speed, direction and extent of these developments is hard to predict. What changes might be necessary in the ITC's remit and what reordering of regulatory structures should be the most effective response to developing technology and services, would be assessed better once there is a more comprehensive understanding of where such developments are leading. This is an issue which needs to be kept on the agenda but which, in the ITC's view, cannot properly be the subject of conclusions at a stage when we are still surrounded by hyperbole and little else.

2. HOW DO YOU RECONCILE THE EXCLUSIVITY OF LOCAL DELIVERY LICENCES (PARAGRAPH 3) AND THE ITC'S STATUTORY DUTY TO ENSURE THAT SERVICES ARE AVAILABLE AS WIDELY AS POSSIBLE THROUGHOUT THE UK (PARAGRAPH 4), AND WHAT SHOULD THE SUB-COMMITTEE INFER FROM YOUR REFERENCE IN PARAGRAPH 3 OF YOUR EVIDENCE TO "WHILE THE EXCLUSIVITY OF LOCAL DELIVERY LICENCES REMAINS"?

There is no inconsistency between the exclusivity of local delivery licences and the duty to ensure that services are available as widely as possible. But to address the issue of whether one necessarily flows from the other, the ITC's approach, which is the same as that adopted by the Cable Authority before it, is that services will be provided as widely as possible if the ITC creates a framework which is favourable to that, and that exclusivity is an important ingredient of that framework. Investment in new cable systems was slow to develop, because of doubts about the viability of the cable business. Exclusivity is an important way of bolstering that viability, and therefore of encouraging investment, until the business becomes firmly established. The ITCV continues to believe that the removal of exclusivity could well have the effect of restricting the extent to which and the speed with which local delivery services spread throughout the UK.

The inference of the phrase "while the exclusivity of local delivery licences remains" is simply that it has never been suggested that exclusivity is for ever. The guidance notes for franchise applicants say that the ITC "does not propose *for the foreseeable future* to grant franchises which will be in competition in the same area". There is a common assumption that at some stage BT will be permitted to provide such competition and, once that happens, the exclusivity will disappear.

3. GIVEN THE PROBLEMS OF FRANCHISING "SMALL TOWNS AND VILLAGES" (PARAGRAPH 4), SHOULD BT BE ALLOWED TO OPERATE A LOCAL RADIO LOOP SERVICE?

It is open to any company, including BT, to suggest to the ITC that applications should be invited for a local delivery licence covering any part of the country, in order to enable the provision of services by means of cable or MVDS. It is not open to the ITC to authorise the provision of services on any frequencies other than those allocated for the purpose by the Government, namely the band between 40.5 and 42.5 ghz. The use for this purpose of other frequencies and technologies would be a matter for the Government to consider.

4. WOULD YOU EXPAND ON YOUR STATEMENT THAT "BECAUSE OF ITS CONCERN THAT ITS FRANCHISEES SHOULD MEET THEIR OBLIGATIONS, THE ITC HAS SUPPORTED THE GOVERNMENT'S POLICY OF NOT EXTENDING, BEFORE THE YEAR 2001, BT'S RIGHT TO COMPETE WITH CABLE OPERATORS, THAT IS, BY GIVING BT A SPECIAL POSITION OF FREEDOM TO PROVIDE ENTERTAINMENT SERVICES WITHOUT A FRANCHISE" (PARAGRAPH 9)?

The reason for the ITC's support of the Government's position in relation to BT's providing entertainment services is that premature competition in the provision of cable television to viewers' homes would undermine the viability of cable operators' businesses and therefore discourage the investment currently being made in broadband cable systems. The scale of that investment has been achieved only comparatively recently, because lack of confidence in the market for cable television had for a long time held it back, and the evaporation of regulatory stability might induce fresh hesitations amongst investors. Given that the ITC's licensees have obligations to build their systems past another 10 million homes or so over the next few years, and to offer a wide range of services to them, the enforcement of those obligations would become more difficult and problematical if investor confidence was harmed.

5. YOU SAY THAT "INSTALLING FIBRE TO THE HOME WILL . . . DEPEND ON SERVICES DEVELOPING WHICH NEED GREATER CAPACITY THAN CAN CURRENTLY BE PROVIDED, WHICH DOES NOT APPEAR TO BE AN EARLY PROSPECT" (PARAGRAPH 13). DO YOU THINK THAT THE CURRENT REGULATORY REGIME IS HINDERING THE DEVELOPMENT OF BROADBAND SERVICES IN THE UK?

The ITC has no evidence that the development of broadband services is being hindered by the current regulatory regime. Indeed, the regime has been designed to encourage that development by giving an incentive to new operators to construct broadband networks as quickly as possible. A broadband network does not need to entail fibre to the home.

6. WHAT ARE YOU DOING TO ENCOURAGE INTERCONNECTIVITY PERFORMANCE STANDARDS (PARAGRAPH 14) AND, IF NOTHING, WHAT PUBLIC BODY IN THE UK DOES TAKE AN INTEREST IN THIS, WHICH IS CAUSING CONSIDERABLE PROBLEMS EVEN WITHIN THE LONDON AREA?

As the ITC memorandum explains, what technical standards exist for cable and local delivery systems are laid down in the licence issued under the Telecommunications Act by the Department of Trade and Industry. The ITC plays no part in this.

7. YOU OBSERVE (PARAGRAPH 15) THAT "ALTHOUGH MUCH OF THE PUBLICITY SURROUNDING THE LAUNCH OF WHAT WAS CALLED THE CABLE REVOLUTION IN THE EARLY 1980S RELATED TO INTERACTIVE SERVICES, CABLE OPERATORS CURRENTLY HAVE TWO DISTINCT BUSINESSES OF A NOT VERY INNOVATIVE NATURE; THE DISTRIBUTION OF CABLE TELEVISION CHANNELS AND THE PROVISION OF A PLAIN OLD TELEPHONE SERVICE. OTHER SERVICES ARE BEING EXPLORED OR TRIALLED BUT THE PICTURE IS OF A SERIES OF DIFFERENT INITIATIVES, OFTEN LOCALISED, WITHOUT A STRONG NATIONAL THEME." WHICH COMPANIES DO YOU THINK ARE BEST PLACED TO PROVIDE INTERACTIVE SERVICES NATIONWIDE IN THE UK, AND WHAT REGULATORY CHANGES ARE NEEDED TO ENABLE THEM TO DO THIS?

The question of who is best placed to provide interactive services depends very much on what interactive services can be developed which meet such a demand or satisfy such a need as to make them viable. Many ideas have so far foundered because they have not passed these tests. The various experiments now in train should help to identify what is worthy of further development and whether such development depends on any regulatory changes.

8. WHAT CONCLUSIONS HAVE YOU DRAWN SO FAR FROM YOUR INVOLVEMENT IN THE CAMBRIDGE TRIALS (PARAGRAPH 17) WHICH THE SUB-COMMITTEE HAS INDEED SEEN, IN ADDITION TO BT'S IPSWICH TRIALS)?

9. ARE CHILDREN BEING ADEQUATELY PROTECTED FROM VIEWING ADULT-RATED MATERIAL FOLLOWING YOUR DECISION TO DISPLACE CLOCK-BASED WATERSHEDS FOR VIDEO-ON-DEMAND TRIALS (PARAGRAPH 21)?

Protection for children from adult-rated material can never be absolute. The ITC's current rules for television channels embody the notion, not that children do not watch television after 9 pm, but that the responsibility for controlling children's viewing post-9 pm shifts on to parents. The rules for video rental prevent children from renting adult material themselves but cannot control when or to whom such material is shown once an adult takes it home. The ITC's experimental rules for video-on-demand attempt in a similar way to impose appropriate safeguards for the protection of children, given the technological mechanisms employed, in order to prevent, or minimise the risk, of children being allowed at their own volition access to adult material. The ITC has no indication so far that any difficulties or disadvantages have arisen in their implementation.

10. WHO SHOULD OFFER CONSUMER PROTECTION FOR USERS OF THE INTERNET AND ON-LINE SERVICES—YOU OR THE INDEPENDENT COMMITTEE FOR THE SUPERVISION OF STANDARDS OF TELEPHONE INFORMATION SERVICES (ICSTIS)?

The regulation of Internet and on-line services will depend very much on their nature and how they develop. It is impossible at this stage to give a definitive answer. Many such services will quite properly lie outside both the ITC's and ICSTIS's consumer protection regulation. Others could fall to one or the other, and it is possible to envisage services which could under current definitions be subject to both, in which case a more considered view would be needed in the circumstances about how the public interest is best met.

Memorandum by News International plc

Executive Summary

1. News International's involvement with the new information technologies includes:
   - *The Times* and *The Sunday Times*—on-line on the Internet
   - Delphi Internet—Internet access provision
   - News MultiMedia—fixed media products
   - News EyeQ—on-line database service
   - BSkyB (40% interest)—satellite television; and
   - News Digital Systems—analogue and digital encryption technology.

2. The extent, diversity and growth of information superhighways should be determined by the decisions of the millions of individual consumers.

In particular, the Government *should not* get involved in the following primary issues, which the market can resolve far more efficiently:

- Restricting the ability of content manufacturers and access providers to merge and cooperate, as companies jostle to establish a place in the future information age
- Picking winners in terms of technological standards
- Engineering artificial network uniformity

3. However, the technology, complexity and international nature of the superhighways mean that the Government will have to get involved in certain secondary issues, to ensure the smooth operation of the market and the maximum benefit to the country.

In particular, central Government (or local Government, where applicable) *should* get involved in issues such as:

- Preventing the publication of pornography
- Removing barriers to entry through competition legislation and de-regulating outdated ownership restrictions
- Giving all homes and businesses the right to be linked to the information superhighway, despite local authority planning rules
- Providing access to the superhighway for all libraries, job centres and schools
- Resisting protectionism within the EU
- Introducing experience and best practice by encouraging media companies from around the world to do business here
- Promoting reciprocal free trade agreements with other countries for media products
- Making government information available on the Internet
- Giving proper legal protection to content providers and clarifying through international agreement how the laws will operate on the superhighway. This applies to intellectual property, defamation and encryption systems.
- Making it an offence to attempt to avoid security, subscription and encryption systems.
- In the longer term, rethinking the nation's secondary and higher educational requirements, devoting greater resources to technological skills.

1. DEVELOPMENT OF INFORMATION SUPERHIGHWAYS

(i) *The Information Industry*

Any sensible discussion of the information superhighway needs to be placed in the context of the information industry as a whole. People seek many types of information and entertainment in many different formats. The idea that there will be one single potential conduit of information providing for society's future information needs is already outdated. There are many developing information distribution technologies.

An information superhighway is a conduit of a large volume of digital information which can be purchased and accessed at high speed by consumers. Many enterprises are involved in the creation, development, packaging and distribution of information and entertainment services. Content can be transmitted in the form of data, text, sound, images, or multimedia combinations thereof, represented in analogue or digital format on a variety of carriers such as paper, microfilm, magnetic or optical storage.

The information industry comprises the different segments of print, electronic and audio-visual publishing. Information superhighways are emerging in electronic and audio-visual publishing; services can range from on-line databases, videotex, audiotex, video games, fax and CD-based services to television, video, radio, audio and cinema. Information and communication technologies and services will play an ever greater role in many aspects of economic and social life in the future.

Much investment in the development of the industry has been made by companies like News International. There has been little return on that investment so far. Nevertheless, News International believes that, over the long term, the existence of information superhighways will fuel demand for high-quality, easily accessible and usable information services. Consequently, many new opportunities for economic development and knowledge-intensive employment will arise.

(ii) *Superhighway Networks*

Superhighways do not normally recognise geographical boundaries, although access to some services provided on some networks can be restricted by the service provider.

The Internet

The World Wide Web, or Internet, is the most dynamic of the emerging superhighway networks. It links millions of people's computers on a network which is not controlled by any single entity. Computers equipped with a modem (to give access to the telephone line) and appropriate software are linked up to the network by an Internet access provider. The parallel is with the telephone, whereby handsets are linked up to the telephony network by the local telephone exchange.

There are now an estimated 30 million computers linked on-line to the Internet and this figure is projected to double every year for some years to come. To that extent, it is reasonable to assume that the Internet has sufficient critical mass to ensure that it will remain the leading information superhighway network until beyond the turn of the millenium.

There are no incompatible "network standards" on the Internet because it was built by the US Defense Department (before becoming known, with its use by the academic community, as ARPANET) to a single set of underlying protocols known as TCPIP or IP. Inconveniences for the Internet user are more likely to occur as a result of blockages on the network. These can occur either because too many people are trying to access the most popular network sites at once (forcing them to queue for their information) or because the computers and network equipment run by specialist firms which route messages are unable to handle such a vast number of messages at once.

It is possible for service providers to restrict access to certain sites on the Internet. The question of whether users will have wide access to services in the future will depend on whether services provided are subscription-driven or advertising-driven. Although most quality services are likely to be subscription-driven, services will be advertising-driven where it is in the publisher's interest to reach as many people as possible.

(iii) *Data Delivery Technologies*

Mobile telephones

Mobile phone networks have recently seen unprecedented growth. Around one in ten adults in the United Kingdom now owns a mobile phone, and the United Kingdom has the two largest cellular networks in the world. Cellular phone networks have the potential to become a major superhighway of the future. Already there are mobile pagers. Mobile faxes and computers may soon follow.

Cellular networks are restricted by availability of bandwidth and the potential of cellular networks to transmit data is not comparable to terrestrial networks. The purchase of PCMCA cards means that there should be no difficulty transmitting data using cellular networks. However, the bandwidth restrictions remain relevant.

It is difficult to transmit data on a cellular network between countries, owing to the different standards which are operated in different countries. News International doubts the feasibility of putting together an intergovernmental agreement to make cellular network standards compatible, owing to the high number of reorganisations which this would necessitate in so many countries. Compatibility between countries will naturally take place if providers perceive sufficient consumer demand for it.

Television

There are many developments in the broadcasting industry which may lead to the establishment of interactive multimedia superhighway networks.

Cable television companies are experimenting with two-way links via coaxial cable down which video, audio, games and text services can be transmitted. The current "patchwork quilt" approach of the Government, which involves the award of franchises to geographically defined regions of the country, has resulted in different services being available depending on one's location. This fact may ultimately hinder the development of cable services both because cable companies will have a captive market in those areas where they hold franchises and because they cannot expand outside them. There nevertheless remains a prospect that different cable companies will cooperate to enable viewers in Scotland, for example, to link up to a London-based service.

An industry-wide agreement was recently reached between future satellite digital service operators and providers, which will entitle broadcasters to compete on fair and reasonable terms and with common standards. Security is vital to the subscription broadcasting business, and the new code of practice will help broadcasters keep in place the systems which control access to television channels. The agreement provides for a common algorithm (the scrambling device used to encode signals) and will go a long way towards preventing pirates gaining free access to signals.

The digital video broadcasting (DVB) agreement provides a model for the future in that it was arranged and signed voluntarily by the industry without the need for direct government intervention at a Westminster or Brussels level.

Legislation has been necessary in the form of the Broadcasting Bill to enable digital terrestrial broadcasting to be introduced in the United Kingdom. Common network standards are likely to exist owing to the restricted amount of frequency available on this medium. News International nevertheless objects to the automatic award of digital franchises to current analogue broadcasters and the unfair treatment of satellite broadcasters caused by the decision.

ISDN Lines

ISDN lines are a medium for integrated multimedia use in that they allow data to be broadcast at high bandwidth from one point to another down voice channels. Different countries have different standards for ISDN lines, and the lines are expensive. Until the standards issue is resolved and pricing reaches more realistic levels, ISDN lines are unlikely to become general carriers of information services for content consumers. They will remain for specialist use by content producers.

2. SERVICES PROVIDED BY NEWS INTERNATIONAL

News International provides or is developing services in each of the areas given as examples in the Committee's *Call for Evidence.*

(i) *The Times and The Sunday Times on the Internet*

News International recently made available its two broadsheet titles on the Internet. In the first six weeks of its existence, 95,000 people registered as readers. They have fast access to text and pictures in the newspapers via their PC and can even make up their own "Personal Times" by requesting only certain sections of the paper.

Access to the Internet site is registration-based. Readers have to provide identification in the form of a registered password and personal identification number (PIN).

News International is keen to see developments in terms of charging for this Internet service but is concerned that effective encryption methods are not available for use. Advanced encryption methods currently cannot be used outside the United States owing to restrictions placed on their use by the US Government. Until such technologies can be developed outside the USA, introducing charging on the Internet will be risky.

News International would like to develop a form of electronic payment for *The Times* and *The Sunday Times* services since registering people and sending them a monthly bill would not be economic. Credit cards are expensive. Mondex cards may be the best way forward.

(ii) *Delphi Creative*

Delphi Creative Ltd is a subsidiary of News International which provides WWW design services and consultancy to News Corporation companies and external clients such as Fidelity Brokerage, the Pentland Group and Uri Geller.

(iii) *News MultiMedia*

News MultiMedia is publishing a wide range of information of a contemporary and historical nature on CD Roms for owners of PC and Macintosh computers.

Examples of published material (or material to be published shortly) include *The Times* and *The Sunday Times* on CD Rom, the "Makers of the 20th Century" series, "Changing Times", the "200 years of major world events" series and *The Times* Perspectives (which draws on original material from *The Times*). The CD Roms come in a multimedia format, in that they are capable of producing sound and graphics as well as text.

News MultiMedia has published heavily in the educational field in parallel with the core curriculum, although new words such as *edutainment* and *realitainment* are often used to describe the fun associated with learning in this format.

(iv) *News EyeQ*

News EyeQ will be launched by News International in June 1996 as an information database aimed at the general user. This is a closed service, not on the Internet, available to people equipped with a computer, modem and appropriate software provided by News International. A central server will be accessed via a password—similar to the way in which FT Profile and FT Discovery services are accessed.

News EyeQ's pricing model will be significantly different to those of FT services, since this will be a mass market service. News International has made substantial investment in software development and sales. It will be available in a Windows format.

(v) *BSkyB*

BSkyB, in which News International has a 40 per cent stake, is the United Kingdom's largest provider of public information, education, finance, and entertainment services via satellite television communications. Text pages and audio-visual programming are available on many different channels. BSkyB may also provide digital broadcast services in the future.

(vi) *News Digital Systems*

This high-technology company includes News Datacom, which has pioneered and developed conditional access systems for analogue and digital television as well as audio and data services, and Digi-Media Vision which makes compression equipment and multiplexes.

3. Superhighway Services Suppliers in the United Kingdom

Categorising the participating companies in the information industry is no easy task since there is a host of specialist services providers in each medium. Consumers may range from schools or libraries to individuals or businesses. Broadly, we can identify two categories of providers:

- *Content manufacturers and packagers.* These include: the creators of the images, text, graphics, sound codes and statistics; the designers and developers of the databases, CD Roms, games and programmes; television producers and authors; multimedia and other publishers.
- *Access providers.* These include: Internet access providers, routers, site operators, cable operators, telecom operators, analogue and digital broadcasters, satellite operators; and end-user supplers, who provide televisions, computers, faxes, mobile telephones, game consoles, set-top boxes and so forth.

The industry is constantly drawing new players—often from other parts of the information service process, like distribution (telecom operators) or end-user access (computer, consumer electronics or software companies)—into what used to be the exclusive domain of the content providers. The many take-overs, mergers, joint ventures and strategic alliances taking place, particularly in Europe and in the US, between different communications and media-related businesses are clear proof of the changing environment the content industry will be facing in the years to come.

Content manufacturers and packagers rightly want to have some control over the distribution chain. This can usually be achieved through normal business practices such as legally-binding contracts between the parties. There may be occasions where a content provider feels it necessary to develop bespoke distribution. It happened when News International decided to distribute its newspapers by road using a contract haulage company rather than rely on the railways. How the distribution chain is organised should be a matter for the businesses involved.

Service Standards

Standards for each service provided on information superhighways have to be driven by the demands of consumers. While it is partly true that the technology is leading the consumer, it is the consumer who chooses whether to buy into the new services made available as a consequence of the new technological developments. Standards of service, and type of content provided as part of the service, will adapt according to consumer tastes and attitudes.

There is no need for government to involve itself in service standards. Common technological standards will evolve in a market led by consumer choice and by industry self-regulation. This has been the case in the development of the television industry. For example, Betamax was discontinued because VHS had become the standard; the PAL satellite standard edged out the over complex and less flexible D2MAC; and in the case of digital broadcasting, the DVB agreement shows that companies which comprise the industry can agree common standards among themselves. News Digital Systems has made a very significant contribution and supports the DVB common scrambling and descrambling standards. The DVB promises network standards. DVB is an EBU body which contributes to ETSI which is a State-sponsored organisation.

Because evolution of service standards should always be left to the outcome of a competitive marketplace, it is difficult to predict how exactly they are likely to evolve. When a government tries to pick winners among technological standards it gets it wrong more often than not because customer preferences are so unpredictable. For example the Commission chose the MAC standard for European Digital television which has recently had to be dropped entirely. This episode caused financial waste and international disadvantage. The Government's role should be to ensure that normal competition law is applied where monopolies arise and that other laws, such as prohibition on the publication of obscene materials, are effectively enforced.

4. Securing Universal Access

Publishers always tend to want to reach as many people as possible since this increases the amount of business they do. For their customers to be able to decide whether they want the services on offer, they first need the opportunity to purchase the services. Some services will always be of such a specialist nature that customers have to pay a high premium for them. But most Internet services will be well within the financial reach of most people, if those people are prepared to allocate their financial resources to them.

Those who are richer will clearly be able to spend more to become "information rich" than others whom Al Gore has labelled "information poor". This raises the question of whether government has a role in helping the "information poor" to gain access to an information superhighway such as the Internet.

The difficulty with any direct government provision is that the lack of a price mechanism inevitably results in people getting what they do not necessarily want and not getting enough of what they do want. But it might be possible to define some areas where government and government-funded bodies could have a useful, if limited, role.

The Government needs to ensure that competition exists in the industry so that customers obtain choice and value. Where there is no competition, regulation can be used to bring it about. Regulation should focus as far as possible on removing barriers to market entry rather than placing barriers in the way of dominant suppliers, although News International does not approve of "deals" between any government and infrastructure builder. Government's primary role is as umpire, not player.

One practical way in which the Government can facilitate the building of information networks into every home, school, hospital and business is to remove legal barriers to information infrastructure investment. Where linking people up to superhighways is concerned, local authorities should not have such overbearing powers. Too often, they impose planning restrictions to stop people gaining access to new services. Every home and business in the country should have a statutory right to erect a television aerial or satellite receiver dish, to be linked up to coaxial cable and to run fibre optic cable into the building. Local authorities should have statutory duties to allow infrastructure builders to have access to every home and business, subject to them meeting the same "clearing up after them" conditions as gas, electricity and water infrastructure operators.

Government should also ensure that public facilities, such as libraries and job centres, have access to information superhighways, and the Internet in particular. Where public bodies need to be linked up to new communications networks, government will need to provide sufficient funds to cover the costs of equipment and infrastructure installation.

Decisions by public bodies concerning which service to purchase should, as far as possible, be taken at the lowest level rather than dictated by politicians. As the products offered in the market are constantly changing, public bodies need the flexibility to take their own decisions according to their own circumstances on what to purchase. They will buy in services where they believe it helps them deliver their own overall service objectives. The publishing industry should be able to deal with them on the same basis as it deals with private sector customers.

5. ROLE OF CENTRAL GOVERNMENT

Some of the tasks of central government have already been outlined elsewhere in this submission. News International believes that central government does have an important but prescribed role to play in helping the industry to develop. Action is needed on three fronts:

- To raise awareness and understanding of multimedia products and services in schools and places of further and higher education
- To encourage a thriving multimedia industry through a deregulated business environment and legal framework which safeguards normal business practices; and
- To make government information available to the public through information superhighway networks such as the Internet.

(i) *Leadership*

Good leadership consists of leading by example. If the information industry is to have the confidence to invest in new technology, it needs to be given a clear indication by the Government of how it intends to enable the industry to develop in the future through regulation or deregulation. Interdepartmental battles can have a stultifying effect on companies as they wait for clear government policies to emerge before committing themselves to investment.

If the Government takes the lead by ensuring that barriers to the development of information services are removed, then enterprising British companies can lead on by supplying the technology and products.

The Government should be vigilant to ensure that no supranational regulations are introduced, especially at European Union level, which hold back the development of the member states' industries. Attempts by some European Union countries to impose restrictions on the content provided by television channels according to country of origin should be resisted. The Government should also seek to promote free trade in all media products. France's protectionist instincts, demonstrated in the last GATT round when they sought to restrict the import of US films, need to be challenged. Europe cannot join in the global information society if the costs of joining in are driven up by its politicians.

(ii) *Promoting inward investment*

Low corporate taxation, minimum red tape, low unit labour costs, low tariff barriers, and a skilled workforce willing to adapt and learn new skills are all needed to attract investment. The fact that the United Kingdom attracts more overseas investment than any other country in the European Union demonstrates that this country has more of the necessary ingredients in place than some of its partners.

Yet opportunities for further investment in Britain in the information sector are being held back by European Union restriction. For example, companies registered outside the European Union can be prevented from doing business here. They should be positively encouraged to come in and do business here, regardless of where they are registered. It may be that some of the profits are repatriated but the beneficial side-effect in terms of jobs would not exist at all if they were not allowed to operate here. If the United Kingdom broadcasting industry was more open to foreign companies, such as those from the United States and Japan, to invest, then the UK could become the engine of the European media industry.

(iii) *Promoting and safeguarding the interests of UK firms worldwide*

Not only can Britain benefit from overseas companies investing here, but British companies can benefit if they are allowed to invest abroad. The Government should try to put in place reciprocal free trade agreements with other governments to ensure that each can invest in each other's countries.

A major strength is our language, since the language of the superhighway is English. British companies marketing content have a head start on many other countries. To take full advantage, British companies need to be able to market their products abroad.

British technology also leads the world in some niche markets. PACE electronics, for example, which manufactures satellite dishes and Integrated Receiver Decoders (IRDs) which receive encrypted signal transmissions and which are then decrypted using a smart card, is a world leader in satellite systems and exports its technology around the world. They would not be in that position if the Government had not allowed non-domestic satellite broadcasting to the UK to go ahead in the 1990 Broadcasting Act with capital from what was then arguably a non-EU company. This lesson must also be applied in relation to digital terrestrial television.

(iv) *Promoting network compatibility*

The Government should not be in the business of promoting compatibility between different networks. Network compatibility will be arrived at if the industry finds it necessary because consumers demand it. Competition and industry self-regulation will determine the form of compatibility.

It is commonly recognised that the liberalisation of European telecommunications networks and services by 1st January 1998 will facilitate the distribution of content and drive distribution costs down, just as the telecoms deregulation in the United Kingdom in 1991 has led to more than one million new telephony lines and cheaper prices. Other data transmission networks need to operate in a deregulated environment if they are to offer better services a lower cost.

(v) *Access to government information*

Making government information available on the Internet is one way in which the Government could lead by example. The Government could establish Internet sites which would make all information held in the Public Record Office freely available. HMSO could also publish its titles on the Internet and be allowed to charge for access. This would be a major step forward for freedom of information, since it would be easier in practice to access government information.

(vi) *Security of payment*

See our comments above in Chapter 2 paragraph (i) on page 7.

(vii) *Verification of information*

Because the Internet is constructed in a way that gives the content provider no control over what happens to data after it has been transmitted to users, it is possible that a third party might be able to put information on the network for which the content provider is not responsible. A third party might also be able to amend or republish information originally served up by another content provider. Providers of original content need legal and technological protection from such pirates.

Copyright

Ownership of copyrights is arguably the most valuable asset on the superhighway.

Creators of new content invest heavily in doing so, and intellectual property rights are the main instrument to ensure they receive fair rewards. Intellectual property rights must be properly protected in all countries so that imitators who simply ride on the back of another company's investment face stiff penalties.

At the moment, legal remedies are often difficult to enforce and the damages recoverable from an action for breach of copyright often do not justify the expense of pursuing the action. Newspaper publishers, for example, rarely find it worth their while suing those who photocopy and make money from their newsprint. These problems are compounded on the Internet—it is difficult to know where the pirates are based and which law will apply.

Despite the Berne Convention, different copyright laws abound throughout Europe and the world. So for example in the UK and the Netherlands (and for all practical purposes Germany) employers own the copyright in works created by their salaried employees whilst freelance writers own the copyright in their own works. By contrast, in several other European countries employees own and control the economic and moral rights in their own works.

News International welcomes the current attempts by the European Commission to improve legislation throughout Europe by using a Green Paper and through instruments such as the Legal Protection of Databases Directive. However, the UK's Copyright Act 1988 has the most developed regulations in Europe and the UK Government must ensure that any harmonisation does not dilute its advantages in any way. As far as possible, a EU Directive covering copyright should take account of developments in non-EU countries, particularly the United States. Organisations like WIPO are working to secure international agreement in this area.

Defamation

It should be possible for an individual or organisation to seek a legal remedy for information published on the Internet which is defamatory. A difficulty lies in tracking down the person who first published and distributed the defamatory information. This will need a technological solution. An additional problem is the allocation of formal responsibility—does it lie with the author, the "bulletin board" or the service provider?

Censorship

Digital media differ from more traditional forms of communication in that they are decentralised and often interactive. In theory less regulation of content should be necessary. No commercial Internet service provider should be burdened with a public service remit, for example.

As far as censorship is concerned, the principle should be that what applies in relation to the traditional media should also apply to the new digital media. So if it is illegal to publish certain material in the United Kingdom it should also be illegal to serve it up on the Internet from a site in the United Kingdom or to receive material from an Internet site overseas which it would be illegal to publish in the United Kingdom.

The Criminal Justice and Public Order Act has already given the police powers to tackle obscenity and child pornography offences, and has extended the law to cover transmission of obscene material by computer.

Encryption and Electronic Tabs

Although copyright, defamation and censorship are all matters which can be brought before the courts, the international nature of the Internet often makes it extremely difficult to take legal action. Publishers may prove to be more effective in protecting their legal rights by developing technical restraints.

One solution is to encrypt data so that only users with the right decoder and formulae can access it. Under the DVB agreement, the broadcasting industry has agreed that the same technological standards for encryption exist within every decoder box. Common technological standards and a common algorithm does not stop different publishers from having their own encryption codes with the obvious advantages to system maintenance and development.

Content providers may develop common technological standards for encryption on the Internet, so that users can access a variety of encrypted services without constantly having to change the decoder equipment in their computer. It is still too early to say what technological standard for encryption for the Internet will emerge as common. At the moment, passwords are the most common way of restricting access.

Encryption is the means by which publishers can prevent people from accessing information for which they have not paid. But technology is also needed to ensure that information published on the Internet is not stolen and subsequently misused. To identify the source of a piece of data it may be possible to attach an electronic tab to it so that when data published on the Internet is accessed it is always possible to identify the original publiser. Attaching an electronic tab to data is a means of watermarking your work so that you can track it down if it is being illegally used.

If it is possible to develop technical restraints to prevent breaches of the law on the Internet, it should be made an offence to try to circumvent the technological restraints which publishers use to protect their material. If it were possible to register a particular encryption method or form of electronic tab with the authorities, then 'hackers' and 'pirates' found attempting to break through the technological restraints could be prosecuted by content publishers.

Electronic protection of copyrighted works should be an option for content providers to consider and should not be mandatory. The electronic protection mechanisms used to protect such works should be designed to comply with industry standards but the implementation of such protection devices should be at the option of the owner of the network. Within the standard, there should be as much diversity as the market can sustain, not least to ensure that a breach of the security mechanism should not compromise all protected works.

6. ROLE OF LOCAL AND REGIONAL GOVERNMENT

As stated above, local government does have a role in assisting the development of information superhighways. Local authorities should have a statutory duty to allow infrastructure builders to have access to every home and business. They should be unable to impose planning prohibitions on the installation of equipment such as satellites.

Local authorities could also provide library facilities with on-line access to open-ended information distribution systems such as the Internet and closed systems such as News EyeQ. In addition they could provide information on CD Rom such as that marketed by News MultiMedia.

Local education authorities should provide adequate funding for schools to gain access to the Internet and other educational information services. A typical school may possess just one multimedia computer in its library. If investment were put into the purchase and upgrading of computer equipment in the classroom, pupils would benefit from new and interesting forms of learning, as well as gaining greater exposure to information technology.

7. EFFECT ON EMPLOYMENT

The information industry is vital to employment prospects. More information will result in more business opportunities. The availability of on-line data will give businessmen a greater appreciation of the nature of the markets in which they operate and will facilitate greater economic activity. It may result in more intelligent, smaller companies.

Better communications will enable the business world to become increasingly smaller. Video conferencing for example, will become more common. Teleworking may become more popular, with less need to travel between places of work. E-mail and other electronic communication methods, such as mobile telephones and faxes operated via satellites, may take market share from traditional communication methods such as the post.

The effect of information superhighways on working practices in years to come is hard to predict and necessarily a matter of conjecture. The need for people to be better acquainted with information technology, products and services will need to be addressed through training in the workplace and in educational establishments. Many young people currently leave institutions of higher education with theoretical knowledge but without any practical skills which they can contribute to an information-intensive business. This places a burden on employers, some of whom are running quite small businesses, who have to spend valuable resources training people so that they can be integrated into their operations.

The nature of some jobs in the information age, such as research work, will be transformed. Information handlers—people who can work with information and who know how to operate complex software—will be at a premium.

Other industries may be downsized. Banking services, such as stockbroking, will be transformed by electronic transactions and the availability of on-line information on the Internet. More products will be marketed on information superhighways. Transactions currently done physically will be done electronically. Retailers may have less stores, replacing them with more warehouses, more customer delivery systems and more computer marketing. They will face new competition from a global Internet retail market. Travel agents on the high street may virtually disappear.

Superhighways will undoubtedly result in more people being employed in the information industry. The European Commission estimates that the content industry currently provides knowledge-intensive employment to over 2 million people in Europe, realising a yearly turnover estimated at ECU 150 billion in 1994. News International alone employs 4,500 people in information provision. Another 50,000 people are employed directly or indirectly as a result of the introduction of the Sky satellite television services seven years ago. The growth in the content industry is considerably above average growth rates and is set to remain so for years ahead.

Information superhighways will be key to the improvement of the economy's competitiveness, as information increasingly becomes a major factor in determining business efficiency and productivity.

8. DOMINANCE OF MASS-MARKET US SOFTWARE

The computer software market is dominated by US companies. Microsoft is the biggest of these, and with a market capitalisation of over $55 billion it remains the undisputed world leader in software marketing. People clearly like buying and using their products. All new software products offer new opportunities to computer users in that they enable the user to apply new techniques for processing information and acquire new knowledge.

New products are constantly being developed in the software market and it is difficult to predict what will and what will not succeed. Some commentators suggest that the Internet spells the end for fixed PC-based software, and that soon people will not even need a computer of their own, just a screen and keyboard. Whatever developments do take place and however much more competition there is, we can remain reasonably confident that US companies will remain dominant in most areas.

But there are some areas of the industry where US software does not dominate. The UK Monopolies and Mergers Commission found last year, for example, that the video games market was dominated by two Japanese companies, Nintendo Co Ltd and Sega Enterprises Ltd, which through their wholly-owned subsidiaries supplied not only virtually all the video games consoles sold in the UK but also about 40 per cent of the games software played on them.

Companies in the United Kingdom do have opportunities to create software in niche markets. News International's Delphi Creative, for instance, is typical of any small web studios mushrooming in North-West London. News International is not going to attempt to predict in which markets the opportunities will arise or which technology or delivery system will be supreme. We obviously hope to be successful in selling the software products in which we have invested.

CONCLUSION

So there are many useful ways in which the Government will need to be involved in the smooth operation of the Information Superhighway. Its involvement as enabler in these issues should ensure the most rapid growth possible and the greatest benefit to Britain.

However, the Government's role must be secondary, except in the areas of intellectual property rights and the deregulation of ownership restrictions. News International believes that the extent, diversity and growth of superhighways should be determined as a result of the decisions of the millions of individual customers.

News International plc

April 1996

Examination of witnesses

MS JANE REED, Director of Corporate Affairs, MR RICHARD WITHEY, Director of New Media, News International and MR LAURENCE JACOBS, Lawyer, Allen & Overy, called in and examined.

Chairman

956. Good morning, Ms Reed, Mr Withey and Mr Jacobs. Thank you very much indeed for coming. Perhaps you would like to begin, Ms Reed, by introducing yourself and your colleagues and making any sort of preliminary statement you think would help us?

(*Ms Reed*) First of all, I would like to say how pleased we are to be here. My name is Jane Reed, I am Director of Corporate Affairs at News International. News International, as you probably know, is a subsidiary of the News Corporation, and we publish four national newspapers, we have a 40 per cent interest in BSkyB, some educational supplements and one or two other things which I will describe. I would like to introduce, Richard Withey, Director of New Media for News International, and Laurence Jacobs from Allen & Overy who helps us enormously on things like copyright. We have had a look at your very informative web site, so we know what everybody else has been telling you—if those pieces are correct!—in which case we believe you have had an extremely good exposition of the whole situation and therefore we do not intend to talk about fundamentals. I thought I might just run over some of the salient points of our submission without going into too much detail, unless you are perfectly happy you have read the submission and executive summary and do not necessarily want me to go into it again?

957. Since we are somewhat short of time and since you did give us a rather good written submission, perhaps it would be better if we moved straight away into the question and answer part of the session. If you felt subsequently that we had left out something which you particularly wanted to tell us, then you should feel free to write to us again.

(*Ms Reed*) Right. In that case perhaps I will do one small thing, and that is to explain once again what our products are, if you like, in the area we are talking about. I will not go into great detail. *The Times* and *The Sunday Times* are on-line on the Internet. Delphi Internet is a joint venture we have with Delphi in America, and it is an Internet access provision and I think most importantly we have developed a web studio (and it is probably one of the state of the art studios in the UK) in Camden Town, an area of London where all the youngsters seem to get together and create wonderful electronic things. They come incidentally from very different skill backgrounds, and training is something which is an important issue in this Sector. News MultiMedia produces fixed media product, a subsidiary of News International, CD-Roms which are largely to do with the core curriculum, or certainly are produced with an educational bias, and we have brought you (and I hope this is not the wrong thing to do) our latest product, so the little bags over there have our latest product which is *The Thousand Makers of the 20th Century*.

958. Since the members of the Sub-Committee are all very much into this technology, we would be very grateful for them!

(*Ms Reed*) Good! That is helpful, and I hope they are useful! As I said, we have a 40 per cent interest in BSkyB, and we have News Digital Systems which is an analogue and digital encryption technology company, part of which is DigiMedia Vision which, as some of you will know, was the development arm of NTL which we bought last year. So those are our background credentials, if you like, for having any claim to the information society.

Chairman] Thank you very much indeed.

Lord Haskel

959. You have told us about these various investments that you have had and about your investment in the development of the information industry, but in your submission you tell us that the return has been very low. Why are you persevering?

(*Ms Reed*) Always a good question to the people who have been persevering with *The Times* and trying to make a profit with it for a very long time!

Lord Haskel *contd.*]

There is a different answer and I will ask Richard to talk about that.

(*Mr Withey*) I suppose the short answer is that we are busy investing in the future. It is pretty much given now that newspapers have been in a long, slow decline, albeit a gentle one, for about the last 40 years, and we have detected also that there is a distinct trend away from newspaper readership in the young. At the same time, of course, that has been accompanied by great advances in computer literacy and knowledge of computing, and we feel young people in particular look to sources other than newspapers for their news information and entertainment. At the moment they are looking at radio and television, but increasingly to the Internet and CD-Roms. We feel that this shift away from newspaper reading really can be likened to the shift from the oral tradition to the written tradition; we are now witnessing a similar shift to the computer literate tradition, and it is just as fundamental. Obviously the shift from the oral tradition to the written tradition took a very long time, several hundred years if you measure it from Gutenberg and Caxton, and you can say it really began to take place after the great Education Acts at the end of the 19th century. We feel the shift to the computer literate society is going to happen very much faster and could actually be complete in every sense of that word probably by the end of our children's lifetime. So in terms of investing in this market and these channels, News feels that is entirely appropriate even though we have to have fairly deep pockets, a lot of patience and take some avenues which will lead to cul-de-sacs. All of that is accepted in the world of new media but nevertheless we do think it is important to invest in these new channels, these new markets, these new demographics which will bring us new readership.

960. Would you like to put a timescale on it?

(*Mr Withey*) It is probably longer than people think, or hope. Mr Murdoch himself is on record as saying he thinks it will be about a 40 year shift, and I think that is about right. I have looked at this in some detail and if you look at any advance in new technology it takes about 40 years to get from creation to true market place, and you can say that about the motorcar and just about anything which has been invented in the last two centuries.

Baroness Hogg

961. But we are not at the beginning of that 40 year period?

(*Mr Withey*) No, we are not, that is true. We are about 15 years into it, and I date it from the arrival of the micro-chip; we are about 15 years down that path. Interestingly, some of the international companies, Morgan & Stanley for example, are predicting there will be 200 million Internet users by the end of this century, but they say that those users will be what they call "consumer adopters", in other words probably highly educated people with high disposable incomes, professional people with kit at home to use this sort of new media format. That means there is a huge market beyond that which the Great British public and the world public are going to switch on to further down the path. 200 million users of the Internet is quite attractive to media companies, but it is only scratching at the surface of what will be available well into the 21st century.

Lord Haskel

962. Do you see these users of the Internet replacing newspaper readers? Will they be instead of newspaper readers or in addition to newspaper readers?

(*Mr Withey*) I think probably in addition to. When I joined News it was to build data bases and I confidently predicted to my friends that within 30 or 40 years data bases would be a central part of the News business. In fact it is a central part already, it is very much core to what we do, storing data and delivering it to people. But that is not going to kill newspapers. I suspect what is going to happen is that currently electronic media are the niche products for us and newspapers are our main bread and butter, and maybe by the end of my lifetime it will be the other way round. I can foresee always a demand for something in front of people which they can manipulate easily, turn over, take to bed, take on a train and so forth. They may be produced and distributed differently; they may be printed in the home for example through satellite but I think there will be newspapers in the way we recognise them.

Lord Gregson

963. Do you not think technology might circumvent that? I have seen the latest flat screen digital television set from Japan, and it is about *that* (*indicating*) big, it fits in the pocket, it is smaller than a Walkman, and it gives a marvellous picture. Incredible. That is a universal newspaper, is it not? You can take it anywhere you like.

(*Mr Withey*) It could be. There is a chap called Roger Fidler who works for Knight Ridder, who has developed that concept, and I think it is probably too early to say whether he is right or not and whether people will adapt to that sort of interface.

964. Kids do.

(*Mr Withey*) Kids do, yes, that is right. As the medium changes, as it becomes less text intensive and more graphic in nature—and after all that is what children now expect to see when they are watching the news or whatever—

965. And miniaturised?

(*Mr Withey*) And miniaturised.—then it could have quite an impact. I hope newspapers do have a role.

966. That might be wishful thinking!

(*Mr Withey*) As a portable format for large amounts of modified text, taken through the hands and minds of people who know what they are talking about, it is a very good medium.

Baroness Hogg] Not all of them know what they are talking about!

Lord Gregson

967. Does this not raise another major issue, and that is this question of where the income comes from, because advertising will be a very different business under those circumstances? Nobody knows where it is going, do they?

(*Mr Withey*) Yes. It has been the key driver so far in our effort. One of the great fears in the newspaper industry generally, both here and in the States, is that the classified market will move very quickly towards on-line, because it is the perfect medium for that sort of transaction; it is a one-to-one transaction, et cetera. Somebody has recently predicted that American newspapers are likely to lose half their profitability in the next five years because of the impact of the Internet. If that is true, that is a significant shift, and that is another reason we are interested in these markets. We are not just interested in reaching readers, we need to take the advertisers with us.

Baroness Hogg

968. That leads us neatly on to the next question, because you touched in your answer on the evolving economics of Internet type services which if financed at all are financed by advertising. Do you see them moving to subscription-based services or remaining with the advertising-based services, or as with newspapers a combination of the two? What do you see as the most likely?

(*Mr Withey*) I think the simile with newspapers is a good one. It is pretty well understood that some newspapers, broadsheet newspapers, depend very heavily on advertising for their survival, and that is going to be true of the electronic media too. We are experimenting in ways to reach initially classified advertisers and eventually the retail advertisers through the Internet, and they are making heavy demands on this. A recent development relating to a site called Yahoo in the States and the relationship they had with Proctor & Gamble has thrown some of this market into disarray. Over the last two years the idea has developed that you can put somebody's advertising site on to the Internet and the very fact of having it there means you can charge for that advertising because people see it. What Proctor & Gamble are now insisting on is that people have to click through that site to their own information before they will pay. That changes the financial relationship quite a bit between the medium provider and the advertiser. I think it is too early to say how it is going to work out but I do see a role for subscription services.

969. Your evidence indicates that you think quality services will tend to be subscription-based?

(*Mr Withey*) I think they will be closed-user groups, maybe through different channels such as closed-user groups on one-to-one on-line transactions rather than through a broadcast medium or the Internet. I think for commodities such as *The Times* archive or *The Times* business pages or *The Sunday Times* innovation pages, there will be a market place for people who are willing to pay money for that if it can be delivered promptly and in a way they like. One experiment we have done is to personalise the paper, so you can pick out the bits you want to see on a regular basis and the newspaper is in effect re-assembled on the Internet to your taste.

970. You cut out the bits you do not want?

(*Mr Withey*) Yes. It actually puts the media very much in the hands of the consumer. It is no longer journalists preaching to people what they think they should understand, it is actually consumers choosing what they want. I think that element of choice will become much more apparent in the next century.

Lord Craig of Radley

971. This cannot go on being a freebie. On the issue of how one charges, I would be interested in your comments about your difficulties, or whether you perceive difficulties, in establishing satisfactory charging mechanisms, bearing in mind the need to rely on encryption of some sort, and the restrictions which are generally widely known on American-based encryption being used outside the United States.

(*Mr Jacobs*) I think you are right that encryption is going to be absolutely central to the commercial development of these services. The problem in the US with the export of encryption algorithms is actually part of a wider problem. There are many national restrictions on the export and use of encryption. The US is obviously the best example because the US is taking such an important lead in the development of new technology and encryption. There are also examples in several countries, France being a good example, where there is not only a restriction on the export of encryption algorithms but also on the use of encryption algorithms for commercial transactions on commercial services, and that is obviously an important and significant restriction at the moment. In the case of America, these restrictions are currently under review. Quite how they can reconcile national security needs with the commercial needs of encryption is currently under review.

Baroness Hogg

972. Do you see the key escrow idea as offering a way through?

(*Mr Jacobs*) I think it is very much in its early stages, so it is difficult to assess how that concept will develop. It does offer some solutions, although at the moment the idea is in such general terms it is very difficult to see the way foward. Obviously this idea could vary enormously in its application particularly as to how much control is retained.

973. And by whom?

(*Mr Jacobs*) That is right. There are very different proposals in America where it is still suggested that the Government can retain control, and in some European countries where it is envisaged that key escrow will be by an independent body which is not a government body.

974. Enforcement officers in the European idea?

(*Mr Jacobs*) Yes. The other important area with regard to encryption is the problem that encryption is very useful but it is not infallible. It is very important that there is improved protection for encryption algorithms and encryption services. At present it is very difficult in many countries to prevent

Baroness Hogg *contd.*]

the misuse of encryption, and this is an area where important efforts will be focused to improve national protection and European-wide protection for encryption. There is currently an EU Green Paper considering all these ideas and this should give users of encryption far more comfort in the future.

Lord Flowers

975. People can write their own algorithms.
(*Mr Jacobs*) Absolutely.

976. So I do not quite see how you can control the import and export of encryption when it comes to the point?
(*Mr Jacobs*) Practically speaking there are problems. For example, with PGP, which is one of the main examples of an encryption algorithm which appeared internationally although there was an export ban on it from the US. At a practical level there are problems and in terms of the commercial use of these services this is obviously unsatisfactory. There has been confusion and uncertainty as to what can and cannot be done.

Baroness Hogg

977. Would you as a lawyer be happy to send sensitive documents, let us say on News International affairs, over the Internet which takes PGP?
(*Mr Jacobs*) The first thing I would do is ask News International if they were happy for me to do so!

Lord Hollick

978. What would your advice be?
(*Ms Reed*) I would say probably not yet, anyway!
(*Mr Jacobs*) It depends on their nature. We, and I think many companies, increasingly use E-mail for communications outside our company as well as within the company. Obviously one would assess the commercial sensitivity of the material and if it was commercially sensitive, at the moment we would not use E-mail.

Lord Gregson] One of the biggest costs of encryption is improving the security of their algorithms. It costs peanuts to write them but millions and millions of dollars to improve the security. That is why the Americans are so desperate about guarding their algorithms, because the average hacker spends about ten minutes breaking an algorithm based on first-time writing, so it means nothing really.

Lord Butterworth

979. In paragraph 4 you have this striking phrase, if I may say so, "Government's primary role is as umpire, not player", and many of your paragraphs do illustrate exactly what you mean by that. My question really is, what existing regulations are there which you would regard as a barrier to the development of an information society here?
(*Mr Jacobs*) At the moment I do not think there are any significant barriers here. I think the use of that phrase in our submission and the concern relating to this issue is that the regulatory framework in the UK at the moment puts us in a very strong position. There is a concern to ensure that this is maintained and developed into the field of new media rather than developing other regulatory proposals. I think that is important for two reasons. The new market is not yet mature, and it is therefore very difficult to see how these services, as Richard was saying, will develop. If one were to impose regulation at this stage it might have a counterproductive effect, because we do not know how the market will develop. The second point is that the regulatory framework we have for telecommunications and media in the UK has put us in a very strong position commercially to develop these services internationally and it is important that that same opportunity is taken in relation to new services.

980. There are some people who might say that they thought Oftel had begun very well and in a very promising way, but some of the proposals they are now contemplating might indicate they are in danger of losing their way. Any comment?
(*Ms Reed*) I do not think we would necessarily have any comment on that, no. I reiterate what Laurence has said really, it is a light touch throughout which is the important thing here. If I could add something there: our experience very much at the beginning of the 1990s, the late 1980s, in terms of Government proposed technological standards is drawn from the D2 MAC and PAL debacle, if you remember that. The high powered satellite and the frequencies which were given to various countries around the world—they were given in this country to BSB—and in not a single country where the Government prescribed the standard and how it should develop did it succeed. In other words there was a medium powered system called PAL, we came along and realised we could commercially do the business, with that and it was extremely successful. As I say, in every country in the world where these standards were prescribed, they failed.

Lord Gregson

981. Was it not more a question less of standards and more of restriction on use?
(*Ms Reed*) Yes, indeed. Yes.

982. Is that not something the cable business is going to avail itself of?
(*Ms Reed*) It is quite possible. I do not know whether it will fail but, yes, too many requirements do cripple the pace of change.

Lord Hollick

983. One of the roles of an umpire is to establish a level playing field. Do you foresee any problems in the superhighway in establishing a level playing field and making sure there is universal access, so we do not have the same sort of gatekeeper syndrome that we have with analogue satellites?
(*Ms Reed*) I love the phrase "level playing field" because it does depend who is tilting the playing field and who is balanced at each end of the playing field. We would love a level playing field in some aspects of

Lord Hollick *contd.*]

television that we have been in for some time and until now have not had. I think from the point of view of the encryption system you are referring to, Sky's encryption system, obviously anybody could have developed that. I say this to everybody, there is no prohibition now on anybody developing their own system. We happened to develop it first and happened to recognise that was going to be the way extra television services were going to be paid for. There are a number of other systems and they can be introduced in this country, they can compete with the system which exists. The fact we have had a head start, or Sky have had a head start on this, is a commercial consideration.

984. I was not asking you to defend Sky's monopoly in satellite broadcasting—

(*Ms Reed*) "Dominant" I think is the word!

985. Monopoly. My concern was, how do we ensure there is a level playing field, that there is open access on the superhighway?

(*Ms Reed*) I feel very strongly that the market is going to do that. I think that if there are competing systems, if people come in and are prepared to pay to develop access to these various things, that is important. As you know, the DGV Group have already set standards for digital and have done a lot of work there, and we were very much involved with that. They have since been enshrined in a Directive, as you again know, and that seems to me to be very important. The question of whether we actually do the same for analogue is one which is being discussed at the moment.

Lord Craig of Radley

986. I was interested in your suggestion that perhaps local government are a particular barrier to progress here. You draw our attention to the fact that they have over-bearing powers. Would you like to expand a bit more on your memorandum which does suggest they stop people having access to these new services?

(*Ms Reed*) That was in the very early days and I was involved in that when we were full owners of Sky Television, and the local authorities were insistent—and in some areas still are—that dishes could not be put up. There were a great number of people who were very upset about that and wanted to have access but subsequently more and more people have had access and the local authorities have changed their minds on a lot of this. There was that automatic resistance to something new—I could not see the difference between a dish and all that ironmongery that is on top of most people's houses—and that was very difficult. In the early days of Sky, there was a resistance from some people which was purely commercial, and there was resistance from some people for simply historic reasons, that it had never been done before and therefore they would not do it, and that was at local authority level and at Government level.

987. That, as you have indicated, is a bit historical now?

(*Ms Reed*) It is only six years ago!

988. But in the sense it is no longer such an obvious example of Government in the wider sense being a player, albeit a bit of a blocker, rather than an umpire. I wondered whether there were any other features of Government activity which you perceive as continuing in the future unless something is done about it because of those sorts of restrictions?

(*Ms Reed*) In terms of local government, I do not think so. I think local government is very important and they recognise the importance of involving the superhighway at every level in libraries and schools, and we just have to emphasise how important it is for them to be enabling, enormously encouraging, as opposed to sometimes, "I do not need another this or that, therefore nobody else shall have one." You do tend to get that tone somewhat. I do not necessarily think people put up specific barriers but there has been a general tone, and I think one should encourage this enabling feeling which will move this forward as much as specific barriers. When you are talking on the wide issue of national government, then I think the tone of voice we have to introduce is one of encouragement for investment from all over the world. I do not think we have to be "Fortress Europe" about this. I do not think that is necessarily a UK problem alone, and in fact I think it is rather less here than in other European countries, but Europe as such has got a somewhat "Fortress Europe" attitude on some of this. I think we should be encouraging new ideas, investment from large companies wherever they come from. There are considerable controls already which exist in terms of competition, in all kinds of other ways, in Broadcasting Bills and this sort of thing, and I feel the tone of voice has to be encouraging and out-going rather than "Protect this, protect that". Let's get the infrastructure up there, let's get the mechanics up there, the technical framework, and then worry about some of the other things, because until you get it up there we have no idea which way the consumer is going to drive this.

Lord Flowers

989. Could you apply what you have just said to the present regulatory structure?

(*Ms Reed*) There is an element of that, yes. As a global company we obviously find this an important issue. We have quite a liberal regime in this country compared to other European countries, but there is still a tone in, for instance, the last Broadcasting Bill Green Paper which to us and others sounded exclusive. It comes down so much to tone of voice and an expression of openness.

990. But not just because there is an increasingly archaic split between telecommunications and entertainment in the regulatory structure?

(*Ms Reed*) That is right, there is an archaic split to some extent. I think also it is about recognising that a great deal of regulation exists already to cope with some of the perceived problems, and I say that because they are problems which might happen and have not happened yet. I found myself saying a lot through the early days of the Broadcasting Bill, "Where is the problem?" There was not a problem, it was just that there might have been a problem at

Lord Flowers *contd.*]

some time in the future. The speculative approach worries us.

Lord Hollick

991. You refer rather intriguingly to "interdepartmental battles [which] can have a stultifying effect on companies as they wait for clear government policies ...". Can you give us some examples of that?

(*Ms Reed*) Since we wrote this six months ago some of these—perhaps "battles" is a strong word, some of this jockeying for position, if you want to look at it like that—have been resolved or are being resolved by interdepartmental committees and that kind of thing. The DTI and the DNH perhaps would admit themselves there was a certain jockeying for position as to who was going to take the lead in this area, and I am very pleased to see that by and large that is being resolved. I think the ITC and OFTEL again see avenues down which both of them could justifiably go, and perhaps are to some extent not jockeying for position but certainly staking out their ground. By all means let them fight this out as long as it does not inhibit progress while they are doing it, which is the important thing.

992. Are there any areas where the Government policy is unclear, where it needs to be clear in order to allow investment to take place?

(*Ms Reed*) I think clarity is coming into that from the Broadcasting Bill particularly, from our point of view anyway. There are other areas which I could not comment on in terms of telecommunications. I believe a lot of those are actually beginning to sort themselves out. I am not saying the way it is becoming clear is necessarily right, but it is being clarified.

Lord Gregson

993. There still is, of course, an unclear picture of how this will allow technology to develop. Since they established many of these regimes, especially on cable, for instance, the technology has dramatically altered to such an extent that the whole thing is technologically a nonsense. That must affect eventually the development of services.

(*Ms Reed*) I could not agree with you more. This is why we constantly say, because we have seen it happening in our own area for the last six or seven years, "Don't do it yet! Leave it with the broadest possible parameter that you can."

994. Then we will have a load of cable companies putting a lot of expensive cabling in the ground which is totally unnecessary, but we have to go on protecting them because this Government has given them a promise.

(*Ms Reed*) We did make a promise, yes, whether for good or ill.

995. [*Question omitted*]

(*Mr Withey*) You are quite right, the last thing we want to end up with is an information superhighway described like the British Railway system from 1840, with different gauges and different companies and so forth. If you want to run trains on a system that is not the right model.

Baroness Hogg

996. Different companies is slightly different from different gauges. Different companies is competitive, different gauges is inefficient.

(*Mr Withey*) Yes. The gauge problem is the real one, and of course the companies have a vested interest in protecting their own gauge, which is a very good simile to the superhighway. I cannot see clearly how this will resolve itself. The more it is left open for the time being until we see what can develop, the better; and the more channels we can use, the better.

(*Ms Reed*) There are competition mechanisms in place which we can use if we see the thing going wrong, but let us see it going wrong before we slow down the pace of development.

Chairman] It is certainly true that 4 foot $8\frac{1}{2}$ inches is a very peculiar distance! Should we move on to the next question?

Lord Butterworth

997. This is about the Anglo-Saxon tradition of copyright protection. You have some admirably-drafted sentences about this subject, and I take it they are probably from Mr Jacobs or at any rate Allen & Overy! What you are saying is that in the 1988 Copyright Act we probably have the best and most developed rules in existence, and you go on to say two things. One, that you hope within Europe harmonisation will not destroy those benefits, which is the first part of the Anglo-Saxon tradition. Then, secondly, you say that Europe should take advantage of developments in non-EU countries, particularly the United States, and of course that is the second limb of the Anglo-Saxon tradition. My question is this: if we are to have this area successfully produced for us, ought we not to rely more on international organisations? What role is there for the European Union, which even if it does anything is only regulating a particular area of the whole?

(*Mr Jacobs*) I think that is the issue, because we are looking at an international or global market, and it is therefore important that any protection is effected globally. The EU is increasingly sympathetic to our approach, and I think most importantly the EU does see these developments as an international development. There was a Commission meeting in Florence last week in which copyright issues were discussed, and WIPO—World Intellectual Property Organisation—representatives were present and are themselves going to be making proposals at the end of the year. The EU certainly sees an important part of its function is to influence and develop WIPO's position on these matters. In the same way as we have traditionally developed our own law to provide the right guidelines within the UK, the EU will obviously do the same, but it also sees an important part of its function is to influence the WIPO debate and ensure proper international protection is available for copyright owners.

998. What you are saying is that the Union are properly sensitive to the position of WIPO?

Lord Butterworth *contd.*]

(*Mr Jacobs*) Absolutely, and they see that it is very important that proposals they put forward within the EU are then followed through within WIPO. That goes on to the other central issue, there are very many specific points of copyright law which could be addressed and need to be defined, but the central issue is one of enforcement. The risk of copyright infringement increases enormously with digital technology. It is not only a matter of getting the protection right in the first place, but ensuring effective means of enforcement are available. While that might be the case in the UK at present it is far less clear in many foreign countries and that is something we need to address.

Baroness Hogg

999. Are there any comments you would like to make on the Defamation Bill going through Parliament at this moment[1] in relation to these areas?

(*Mr Jacobs*) There are obviously several general points about the Defamation Bill but relating specifically to these areas we were very pleased to see the amendments adopted which made it clear that an electronic data base provider and service provider are included in the exceptions to the definition of a publisher in section 1. There is still a slight inconsistency which concerns us, and it is a lawyer's point I am afraid, but the way it is currently drafted indicates that the categories of service provider which fall outside the definition of a publisher fall outside because these types of service providers do not control the material which is being published. At the same time, they can only rely on this defence in section 1 if they used reasonable care in the way that they regulate their activities and the publication. It seems to me that there is a real difficulty in reconciling those two principles in the current proposals.

1000. Because if they use reasonable care they are controlling them?

(*Mr Jacobs*) Precisely. That seems to me to be an area of uncertainty which as yet has not been resolved.

1001. That has been an issue in the United States.

(*Mr Jacobs*) Yes, very much so.

Lord Gregson

1002. Is there not going to be a great difficulty in that things like the Internet and the superhighway are going to be international media and if you have 57 varieties of different defamation laws and other regulations, how the hell are you going to resolve them? This latest hand-out from the Supreme Court in America has kicked the whole thing backwards, has it not?

(*Mr Jacobs*) There is a real risk of forum shopping; for example of people choosing one particular jurisdiction to bring an action for defamation and choosing another jurisdiction for copyright and another jurisdiction for a contractual dispute. I think that is something which needs regulation or needs harmonisation so we can avoid or control the problems.

1003. For an international company like yours with assets in many countries around the world, it leaves you in an extremely exposed position?

(*Mr Withey*) It is difficult to publish *The Times* on the Internet because it is "legaled" from the point of view of UK law. We tend to err on the side of judgment and leave things out if we think there is going to be a problem. It is quite easy to control what goes into a particular environment because you know who is using it and where from; you can cut things off or give them a different version or whatever.

Chairman

1004. Can I ask whether you have made those legal points on the Defamation Bill directly to the Government? By the time our report is published it will be too late perhaps.

(*Mr Jacobs*) They have been raised with the DTI, yes.

1005. I am afraid time's winged chariot which is punctuated by Big Ben has overtaken us again, and we shall have to draw this session to a close. Thank you very much indeed for coming and being so frank and helpful in your evidence. I notice your written evidence is marked confidential, if you could possibly adjust it so that it could be published along with the other written evidence which has been submitted to us, that will be even more helpful.

(*Ms Reed*) We are doing this while we speak! You should have it by the end of this week.

Chairman] Thank you very much indeed.

THURSDAY 20 JUNE 1996

Present:

Craig of Radley, L.	Hogg, B.
Flowers, L.	Phillips of Ellesmere, L. (Chairman)
Gregson, L.	
Haskel, L.	

Memorandum by the Department of Trade and Industry

INTRODUCTION

This memorandum provides information responding to the Committee's request for evidence dated 15 May 1996. The Department has submitted two memoranda in response to previous requests before and after the oral evidence session on 30 January 1996. In particular it deals, as requested, with issues relating to the regulatory framework in the UK and the DTI's Information Society Initiative (ISI). We also take the opportunity to cover some significant developments since our original submission in January on the other issues raised then, and which are not otherwise incorporated in the discussion of the regulatory framework and the ISI.

REGULATORY FRAMEWORK

Here we consider the development of the regulatory framework, first in relation to telecommunications, which has provided for the building of the superhighways, and secondly in the wider context of the convergence of telecommunications, broadcasting and Information Technology (IT).

Regulation: Building the Superhighways

The policy framework adopted consistently by the government from the early 1980s has been to liberalise the provision of telecommunications progressively, in a managed transition from monopoly state provision to competitive market supply. To achieve this, the regulatory framework has had to evolve steadily in order to cope with progressive liberalisation. At the same time it has had to provide sufficient stability to underpin investment confidence. As noted in the Department's initial memorandum, establishing advanced communications infrastructure and services for the UK requires a long-term strategic perspective, involving substantial investment. This means that regulatory stability is crucial.

A Revolution Through Evolution

Prior to 1984, telecommunications services in the UK were provided, as they still are in many countries, exclusively by state monopoly. Recognising the value of competition in improving service, reducing costs and strengthening this strategic sector to deal with globalising market forces, the government privatised the state monopoly, British Telecom (BT), in 1984.

This was only the beginning of a long-term process. The government took the view that the UK should not move in one fell swoop to unfettered competition. The market in the UK at that time could not support the unassisted entry of new players, given the overwhelmingly dominant position of BT. BT itself needed to learn how to deal with new market disciplines and to compete effectively with other companies, particularly from overseas.

The Telecommunications Act 1984 set the framework for the duopoly policy, assisting the establishment of Mercury Communications Ltd as the principal competitor to BT in fixed-link telecommunications. It also established the Office of Telecommunications (OFTEL) as an independent regulatory body to compensate for the absence of full competition in the duopoly. Significant reductions in the costs of long-distance phone calls, and improvements in service were delivered as Mercury built an alternative long-distance network, and both companies developed their competitive strategies. That same year, the Cable & Broadcasting Act introduced a framework for licensing cable television franchises in the UK. (This framework was later updated by the Broadcasting Act 1990.)

Sustainable Competition

The next major step came in 1991 with the White Paper on Telecommunications Competition Cm 1461. This review of the duopoly policy concluded that competition between alternative network infrastructure providers was vital to sustaining effective competition for communications services in the long term, and thereby maximising the benefits for consumers. Indeed, this remains a central element of our regulatory policy. It is an important underpinning for sustainable competition in the long term, particularly as industry convergence brings pressures for varying degrees of vertical integration between information production, conveyance, service delivery and equipment manufacture.

The local loop is particularly important here as it provides the competing operators with direct access to the customer. So, from 1991, the restriction on the number of public telecommunications operator (PTO) licences was lifted, and in particular, all cable franchise operators were allowed the possibility of providing the full range of telephony services within the UK.

At the same time the Government confirmed the continuance, until at least 2001, of the policy established in 1984 that BT (or any other established, national PTO) should not be able to use their existing national networks to provide broadcast television services to homes in competition with the cable franchisees. On the assumption that effective competition develops in the market, this policy will be reviewed in 2001, but not before. The cable entrants therefore enjoy some limited protection from BT's dominant position in order to allow competition to become effective. The suggestion is sometimes made this prevents BT from competing to provide, or even invest in, the development of superhighways and services—that regulation is asymmetric. However, this is simply not the case. BT is not prevented in any way from offering a wide range of interactive services to any customers over its national network, including, for example, video on demand. The policy disallows the use of the national network only in the provision (or the conveyance) of broadcast entertainment services to homes. Even here, BT (or any PTO) may still compete for the provision of broadcast entertainment services to homes on the same basis as everyone else—by making an application to the ITC for a "cable franchise". The ITC will run a competition for a franchise covering a particular area if there is a credible interest and case for offering service. If successful, BT (or any other PTO) may provide the entertainment services over their existing network within the franchise ie: provided they maintain logical separation between the networks providing the national and the franchise-based services.

The Impact on Investment

The commitment to long-term regulatory stability has brought forward an investment commitment of £10-12 billion over the course of this decade from the cable franchise-holders. Of this, over £5 billion has already been spent. A further investment of around £2 billion by the cable companies is scheduled for this year, which will create over 2,000 extra jobs. To date the franchises have been let covering around 16.5 million homes (73 per cent of all homes in the UK) and the new networks have passed around 6 million of these, and connected some 500 schools without charge. Franchises are expected to cover around 80-85 per cent of homes in the UK. Plans for 1996 anticipate that a further 2.7 million homes will be passed by cable this year. In 1994 alone, investment in cable roll-out was more than double that in the entire period between 1986 and 1991. There are now nearly 150 cable franchises, six mobile networks, and over 20 other PTOs and radio-based operators offering telecommunications services in addition to BT and Mercury.

Although it has chosen not to seek a significant number of television franchises, BT has continued to invest in response to competition—some £25 billion since 1984, including £2.7 billion last year alone. The Committee may be aware of BT's plans, announced in December 1995[1], to upgrade its network to fibre-optic cable as far as all 88,000 street cabinets in the UK. The Government welcomes this move as a strategic response to the competitive pressures which have been able to emerge as a result of its commitment to a stable regulatory environment. Such a move represents a further positive contribution to the development of diversity in broadband superhighways within the UK.

The cable franchises and other networks are already capable of offering broadband services—carrying vast quantities of information at very high speed. Massive investment in modern communications infrastructure, by cable franchisees, by BT and by other PTOs, is taking place precisely because the Government is committed to regulatory stability in this area until at least 2001. Cable roll-out continues to accelerate and consolidation within the industry is taking place. Alliances and mergers (such as the recent acquisition of NTL by Cabletel) provide an increasingly diverse range of operators with interconnect capability all over the country. A further illustration of the considerable success of this policy since 1991 is given by OFTEL's recent proposals on BT's next price cap. As explained in the next section, since competition is now developing strongly in the UK telecommunications market, OFTEL are proposing to subject a smaller proportion of BT's revenues to the retail price cap from next year.

All these networks—a network of networks, interconnecting in a seamless web—are providing us with the information superhighways of the future, today.

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[1] 24 December 1995 (Sunday Times)

Regulation by OFTEL

OFTEL has provided regulatory oversight of the maturing market. While BT has begun to feel the competitive pressures of the market, it has responded well. Tariffs have fallen by around 40 per cent in real terms since BT was privatised and quality of service has improved dramatically. BT has also built a strong global presence.

The approach to regulation has evolved over time as competitive pressures in the market have grown. The starting point was very close regulatory control of BT. Over time the approach was extended to other operators, but is increasingly developing away from detailed and intrusive licence conditions towards a more general framework aimed at sustaining the emerging competition. In its latest review of the position, OFTEL published on Monday 3 June firm proposals for the telecoms regulatory regime for 1997-2001. These include new price caps, on retail and wholesale (ie, interconnection between networks) tariffs.

OFTEL is proposing to set the new retail price cap at RPI -4.5 per cent. The cap would only cover the 80 per cent of retail customers with the lowest usage. This therefore includes most residential customers, but excludes large corporate customers and very heavy domestic users. (The effect on BT's revenues of this limited 4.5 per cent cap is similar to the existing 7.5 per cent cap, since the latter covers a much wider basket of services. Any harsher price cap might have deferred investment by BT and particularly its competitors.)

These proposals represent significant deregulation. The growing competition in much of the telecoms sector means the market can be expected to deliver cheaper and better services for most customers. The more limited cap proposed would mean only 26 per cent of BT's revenues became subject to retail cap, compared to 65 per cent now. OFTEL expect this to be the last price cap.

OFTEL also propose to include a condition in BT's and other operators' licences prohibiting their abusing a dominant position. This proposal is the subject of continuing discussions between BT and OFTEL but underlines the trend away from detailed regulation.

The Government recognises that the Director General of Telecommunications argues strongly for such a licence condition prohibiting anti-competitive behaviour, and that it is now for BT to consider whether to accept or reject the whole package. BT cannot be forced to accept the condition, but the company needs to consider whether a lengthy MMC reference would be overall in its best interests.

International Liberalisation

Thanks to our stable but increasingly liberal regulatory framework, the UK now has a commanding lead as the telecommunications hub of Europe ahead of EU liberalisation due to take place by the start of 1998. The EU has taken significant steps towards the liberalisation of telecommunications markets, following the leading example of the UK.

In particular, the Article 90 Directive on Full Competition (96/19/EC) adopted by the European Commission on 13 March requires all Member States to abolish special and exclusive rights, for facilities and services, except public networks and public voice telephony, by 1 July 1996 and for all services and networks by 1 January 1998 (except for a few Member States with derogations). This liberalisation is being accompanied by a legislative programme to ensure a minimum standard of regulation across the Community. The Government expects the Commission to act vigorously to ensure all Member States comply with their obligations.

The Government announced on 6 June that it was willing to issue further licences to provide international services from the UK, on the same terms enjoyed up to now by only BT and Mercury—that is, on telecommunication facilities owned and controlled by the company providing the service. This liberalisation is accompanied by an opening up of all routes for resale services, ie, those being provided over international leased circuits. It will benefit users by bringing down international rates more quickly, and benefit the UK economy by attracting new investment, both by telecommunications operators and user companies, to the UK. In order to ensure competition in the international market remains fair, the licences will contain many of the provisions already in PTO licences and in those for international simple resale. In particular, they will give the Director-General of Telecommunications powers to prevent one-way bypass or discriminatory practices between affiliate companies. (One-way bypass can arise where an operator based in a less liberalised regime continues to charge UK operators higher rates to have their calls delivered, while benefiting from the use of its own infrastructure in the UK.)

The Government has taken this step in response to the progress of liberalisation world-wide. A number of countries have opened up their international markets, and, as noted above, EU member states will be obliged to follow suite from 1 January 1998. Good progress continues to be made world-wide. Although the Government was disappointed that the WTO talks did not conclude definitively during April, it hopes that agreement can be reached next Spring. Global liberalisation would be of benefit to all countries involved and it is incumbent on countries with experience of operating a liberalised market to provide an example of the benefits to consumers and to the economy as a whole.

Regulation: Implications of Convergence

The technological and commercial convergence between broadcasting, telecommunications and information technology is leading to the development of multi-media products and services. This convergence is proving to be a powerful driver of economic growth. The Government recognises that this convergence may ultimately require a similar convergence in regulatory structure, and the Government will continue to keep market developments under review. However, at present, the commercial integration of companies operating in these previously distinct sectors remains at an early stage.

Overall, the Government leans towards a light touch in regulation of the developing markets. This section considers examples of services arising in the converging markets, and the key distinct elements which need to be present in the core regulatory framework as it evolves.

The Internet

The internet is perhaps the most direct illustration of the issues raised by convergence and multi-media services. In particular it raises issues relating to content of material (an area traditionally associated with regulation of mass media) in the context of a communications network (where the focus has been principally on the regulation of competition).

On the question of Internet content, the Government has made clear that the status of illegal material is the same whether it appears on the Internet or elsewhere. There is also a degree of public concern about material which, while not illegal, is offensive and unacceptable to many. The Government believes self-regulation by the industry is the best way to deal with questions of access to such material. Recent months have seen the formation of an Internet Service Providers Association (ISPA) which is attempting to form a consensus within the industry around arrangements for self-regulation. The Government has encouraged the formation of ISPA and its moves towards formulating a Code of Practice for Internet Service Providers, and DTI has offered to second an official to help with the development of the Code. Effective action can be taken with the help of these market players. Protective software packages and tools, such as classification schemes which parents and schools can use to protect children from inappropriate material, are already available and in use. Further progress is possible, for example, through the widespread deployment of common approaches such as PICS (Platform for Internet Content Selection), which provides a general approach to screening of content which can be accessed.

Generic Converged Superhighways Services

The Internet is offering a *de facto* implementation of superhighway applications, albeit on networks which are not always broadband end to end. In addition, the provision of broadcast entertainment services already takes place, of course, over communications networks in the form of cable television delivery. This requires licensing under both the Broadcasting Act (concerning principally issues of programme provision ie content) and the Telecommunications Act (concerning principally the transmission of programme services ie relationships in the communications supply chain).

Services broadcast "over-air", whether terrestrially, or via satellite, are similarly regulated under both Acts, with an additional licensing regime relating to allocation of the necessary radio spectrum—the Wireless Telegraphy Act. These transmission media can combine with the superhighway networks, which in providing a return path, can bring an element of interactivity comparable to that where the broadcast element of the service is delivered over the network itself. The interactive coupling can be achieved through the piece of consumer equipment which can interface traditional televisions on the telephone network—what we currently know as the "set-top-box", containing components to decode digital television signals and to connect to a fixed-link data network.

The set-top-box also introduces a key technology for the development of commercial services in the general superhighway environment, namely—conditional access. In relation to entertainment services offered over the networks, this is the technology which ensures that only those viewers, or users, who have a valid contract with the service provider can gain access to the service. This has been developed primarily in the context of passive viewing of television programmes, but it is also potentially applicable to the problem of granting access to commercial "on-line" services—for example, access to the on-line "mail" for home-shopping services, or to database servers on subscription. In fact, any service for which access control is required to secure payment for subscriptions or one-off fees.

This conditional access technology is particularly important because it acts as a gateway between the service providers and the consumers. Clearly, consumers will not want the additional expense and clutter of multiple conditional access "boxes", and once a population of boxes is established, operating to a particular standard, then the owner of those boxes becomes the gatekeeper between the service providers and the consumer. This in itself signals a possible need for additional regulation, particularly when the gatekeeper might himself be a service provider in competition with others who would need to use the conditional access gateway.

This, then, is the first concrete example of a new regulatory issue thrown up by the development of convergence. The government has taken the first step in dealing with this issue by publishing proposals to regulate the supply of conditional access services for digital television (whatever the means of distribution). This implements our obligations under the EU TV Standards Directive, and, since the issues involved, as described above, are primarily about the regulation of economic relationships in the communications supply chain, we propose to use the Telecommunications Act framework to provide a licensing regime to control the potential for abuse on the gatekeeping position. The Government first published proposals for this on 15 January, and is currently considering the responses to the consultation. We expect to publish a draft statutory instrument implementing these proposals for further consultation in the next few weeks.

Key Elements of the Regulatory Framework

The licensing of services which are increasingly being delivered over the superhighways illustrates a division of labour amongst a number of regulatory authorities. In particular the Independent Television Commission (ITC) is responsible for licensing under the Broadcasting Act, while DTI issues, and OFTEL enforces, licences under the Telecommunications Act. (DTI, through the Radio Communications Agency, is also responsible for the allocation and management of radio spectrum.) The principal distinction which underpins this division of labour is one between questions of content and its regulation on the one hand, and economic relationships in the communications supply chain and their regulation on the other. The introduction of conditional access licensing under the Telecommunications Act, through DTI and OFTEL, represents a simple continuation of this approach.

This division of responsibilities is perfectly workable in current circumstances, though the Government will continue to keep market developments under review. Other regulatory issues are raised by convergence: for example, the protection of intellectual property rights (which we discussed in our previous submissions); questions about advertising and privacy; and the possibility of telephone and broadcast services being provided on the internet. However, even with full convergence, the issues can be categorised into two broad groups: those relating to economic relationships in supply and competitiveness on the one-hand, and those relating to content and culture on the other. This distinction remains meaningful as convergence grows and will, we believe, continue to be reflected in the evolving regulatory framework.

The Information Society Initiative (ISI)

A significant development since the Department submitted evidence to the Select Committee in January this year has been the launch of the Information Society Initiative (ISI), on 13 February 1996, by the President of the Board of Trade. The Select Committee may wish to note that the DTI is offering a presentation on the ISI to interested members of the House of Lords on the morning of 26 June 1996.

The Department believes that UK business as a whole is well-placed to take advantage of the emerging information society and the opportunities for improving our global competitiveness that it presents. This relects a number of specific strengths in the UK's position, including the existing of a liberalised telecommunications regime, our strong publishing and broadcasting industries, and the primacy of the English language as a medium for international communications. Nonetheless, there remains a significant degree of cultural resistance to the applications of new technologies, particularly on the part of smaller businesses who may not be sufficiently aware of the potential benefits. This assessment is broadly supported by an international benchmarking study commissioned by the Department which will shortly be published. The ISI is designed to help UK business meet the challenge of the emerging information-based economy, and improve its position still further.

The ISI brings together the range of existing and new DTI support programmes in the field of information and communication technologies into a coherent whole. It is designed to raise awareness, spread best practice, and demonstrate the practical benefits of adopting new technologies, with a particular but not exclusive focus on the needs of smaller user companies. By providing a coherent framework for activities in this area, the ISI aims to maximise the impact of DTI programmes, to help avoid the risk of duplication and gaps, and to enable businesses to see more easily the scope of DTI activities and identify specific programmes of interest to them.

The ISI is a four-year programme, until the year 2000, and is intended to develop over this period in response to changing market conditions and the needs of business. The ISI is supported with £35 million of new money over the course of its life, in addition to the funds already in place under certain pre-existing programmes. The ISI is designed as a partnership with business. Consultation with businesses and with business organisations was an important factor in determining the scope of the initiative prior to its launch, and some 70 companies have agreed to collaborate with the Department in support of the ISI.

There are currently some 36 individual programmes under the ISI umbrella. The full range of programmes is outlined in the ISI information pack which accompanies this submission (it should be noted that not all ISI programmes are designed to appeal to the same business audience, and the Department would not usually send the full range of ISI literature to a business without first establishing their specific areas of interest). What follows is not an exhaustive list of the programmes under the ISI. The initiative is designed to be flexible to the needs of business, and the content and balance of programmes may be modified over time. But programmes within the ISI can broadly be categorised under the following headings.

Awareness activities for SMEs

A primary objective of the ISI lies in helping to ensure that smaller firms, who may be new to, or inexperienced in, the use of information and communication technologies and the applications of electronic networks, have access to expert advice and guidance in a manner convenient to them. A key programme is the establishment of a network of some 50 Local Support Centres around the country, able to offer easily-accessible practical advice and guidance to companies in their area. These will generally be based upon existing Business Link partnerships (and their equivalents outside England), and Business Links will shortly be invited to put forward proposals for funding from the Department to support them in setting up such centres. Three pilot Local Support Centres—at Lisburn in Northern Ireland, Manchester and Harlow—have already been established with DTI support.

The ISI also supports business intermediary organisations, such as trade and professional organisations. It is important that such bodies should be encouraged to make effective and appropriate use of new electronic networking applications, both to enhance the services which they can provide to their member companies, and to act themselves as examples of best practice. A Trade Association Challenge was recently launched inviting proposals for DTI support, on a competitive basis, to help Trade Associations implement plans for the adoption of new technologies in this way. Proposals are currently being assessed, and winners will be announced shortly. Further Challenges on a similar basis will be launched for Research and Technology Organisations, and for Professional Institutions, later in the year.

In addition to encouraging the development of these centres of business support at local and sectoral level, the Department is making awareness material directly available to businesses. Publications already available include a series of case studies highlighting the uses of multimedia technologies at work, a beginners' guide to information and communication technologies, and a business user's guide. Further publications are being prepared. This material is designed to inform businesses, in a practical and jargon-free manner, of the benefits that can be achieved through applications of new networked technologies, and to highlight some of the issues that may need to be considered when assessing the business case for adopting them.

An Information line has been set up to deal with enquiries relating to the ISI, to provide information on programmes and events, and to handle requests for material. To date, the Infoline has received approximately 4,500 calls, and nearly 200,000 copies of ISI publications have been distributed. The Infoline can be contacted by telephone (0345 15 2000) or by e-mail (info@isi.gov.uk), and the ISI web sit (http:/ /www.isi.gov.uk) also contains details of ISI programmes.

Award Schemes

There are two principal award schemes within the ISI. The Multimedia Demonstrators Programme (MMDP) aims to support the development of innovative products which demonstrate a clear business benefit from the application of existing multimedia technologies. Eligible applicants must be partnerships between supplier and user companies. The first call for proposals recently closed, and over 200 applications were received. These are currently being assessed, and awards will be announced shortly. The Department aims to announce later in the year detailed arrangements for the second call for proposals under this scheme.

The Information Society Creativity Awards will be launched shortly. These awards are aimed at companies looking for support in turning their creative ideas for using new digital technologies into marketable products. They are likely to be of particular interest to companies in areas such as electronic and print publishing, TV, the music industry and advertising and design. A separate category of awards is designed to support creative ideas from students.

Technology and Technology Transfer Programmes

The ISI incorporates a number of programmes in the areas of new technology and technology transfer, of interest to technology-based companies, particularly smaller firms, involved in communications and IT. Current programmes include the development of demonstration test-beds for digital broadcasting, and for broadband mobile communications, promotion of the use of microelectronics among companies engaged in electronic product design and manufacture, and projects in areas such as photonics, neural computing and speech and language technology. New programmes will be introduced as the ISI develops, aimed particularly at enabling people to gain the knowledge and skills to make better use of technology and gain a competitive edge by enhancing their products and services through the application of existing technologies to new areas.

European Schemes

The European Union is currently very active in assessing the social and economic impact of new multimedia technologies, and encouraging the development of information and communication industries. An important element of the ISI is to draw upon these efforts at European level, and to ensure that UK companies are aware of the various programmes and activities in existence. Significant funds are available to support projects in the field of information and communication technologies at European level, through programmes such as Telematics, Trans-European Networks in Telecommunications, ESPRIT, ACTS and the recently launched INFO 2000 programme, some of which are discussed further below. The ISI highlights the existence of these programmes and provides contact points within the UK for firms seeking information and guidance on how to participate.

Applications of the Information Superhighways are supported by a number of European Union programmes, some programmes are part of the Fourth Framework Programme (FP4) of research, technology development and demonstration (RTD&D) and others more concerned with implementation are outside the FP4. Within the Framework programme, the information and communication technology theme is of most importance. This theme consists of three programmes, namely, Telematics Applications, Advanced Communications Technologies (ACTS) and Information Technology (formerly ESPRIT). Although applications of "superhighways" are to be found in all three programmes, those in the IT/Esprit and ACTS programmes involve highly sophisticated users testing leading-edge technologies while the users involved in the Telematics Applications Programme are more concerned with applications of existing technologies to solve current problems and more diverse, ranging from national and local public administrators, healthcare professionals and doctors, to members of the public accessing information through kiosks.

Outside the Framework Programme a number of implementation and application content programmes are either in place or being established. Often, these activities are related to the 1994 Delors White Paper on "Growth, Competitiveness and Employment" and the Bangemann Report entitled "Europe and the global information society; Recommendations to the European Council", which proposed 10 examples of applications of ICT to encourage the creation of a European Information Society. Included amongst these was the use of electronic links between public administrations. The Interchange of Data between Administrations (IDA) programme, now entering its third year, aims to improve the efficiency and effectiveness of trans-european information exchanges in a variety of areas, eg customs and indirect taxation, agricultural statistics, pensions and social security etc, by replacing paper and telex systems by electronic data exchange based on international standards such as X400 electronic messaging. The Commission has further proposed that other Bangemann-type applications will be implemented through the Telecommunications Trans-European Networks (T-TENs), currently under consideration by the Council of Ministers and the Parliament. In addition, multilingual applications of the European Information Society will be the subject of a further proposed programme (MLIS). The INFO2000 programme, concerned with the information content of applications, has recently been agreed by the Council of Ministers and European Parliament and has just launched a Call for Proposals.

The UK has been very supportive of the Bangemann report ("Europe and the Global Information Society", May 1994), and of subsequent Commission discussion documents explaining plans for its implementation. Subject to budget constraints, DTI would wish the EU Information Society to feature strongly in any new Framework Programme for research, technology development and demonstration. UK industry are keen participants in these programmes because of the benefits they bring—new markets and opportunities, new standards and information system architectures, strategic partnerships, access to leading-edge research, experience in doing business in Europe.

G7 Information Society Development Conference

The January memorandum, and our supplementary submission referred to a number of G7 projects relevant to the ISI. Since then, the Information Society and Development (ISAD) Conference was held in South Africa on 13-15 May and was attended by 40 countries and 18 international organisations. It followed on from the G7 Ministerial conference on the International Society in Brussels in February 1995 which agreed a set of principles including promoting dynamic competition, encouraging private investment, defining an adaptable regulatory framework and encouraging open access to networks and set up 11 pilot projects. The ISAD Conference focused particularly on the need to integrate developing countries into the global information society that is emerging.

The United Kingdom's delegation was headed by Ian Taylor MP, Minister for Science and Technology, and consisted of senior representatives of BT, BBC, ICL, Reuters, ICO Global Communications and Matra Marconi Space. The delegation highlighted the UK's experiences of competition, liberalisation and stable regulation and emphasised the need to reduce barriers to the flow of information and that technology assisted, rather than restricted, cultural diversity.

The Chair's Conclusions were produced following two meetings of Ministers. These preserved intact the principles agreed at the Brussels conference and identified key policy issues, including private investment and competition, stable regulation and fostering public/private sector partnerships.

The Department welcomes the conclusions to the conference which set out a clear path for the extension of the superhighways to developing countries, and establish a common way forward in promoting the information society. The conference recognised that the private sector has the primary role in creating the global information society, in partnership with the public sector where appropriate.

OTHER SIGNIFICANT DEVELOPMENTS

A number of other issues mentioned in the January memorandum have seen significant changes relevant to the development of superhighway applications.

Cryptography and Confidentiality

As a direct result of the inter-departmental discussions, which we referred to in page 14 of our original memorandum, the Government has now announced a policy to facilitate the use of cryptography for commercial purposes, including confidentiality. Mr Ian Taylor MP, Minister for Science and Technology, in answer to a recent written Parliamentary Question, informed the House that the Government are introducing proposals for the licensing of Trusted Third Parties (TTPs) for the provision of encryption services. A paper outlining the Government's proposals has been lodged in both Houses. A copy of this paper is attached at Annex A to the memorandum.

Radio Fixed-Link Communications

Our January submission mentioned that applications were being invited for further licences for radio-based telecommunications licences in the 2 and 10 Ghz bands. Following a competition the Government announced, earlier this year, that it will be awarding three licences (to Mercury, Ionica and NTL) for radio fixed access in the 10 Ghz band to provide ISDN services. A further two licences are similarly to be awarded in the 2 Ghz band (to BT and RadioTel) to provide services in remote rural areas—including much of the Pennines (cf oral evidence given by BT).

The Committee will also be interested to know that Ionica launched its first radio fixed access service offerings in May this year.

DTI
June 1996

PAPER ON REGULATORY INTENT CONCERNING USE OF ENCRYPTION ON PUBLIC NETWORKS

1. Summary

1. The Government recognises the importance of the development of the Global Information Infrastructure (GII) with respect to the continuing competitiveness of UK companies. Its aim is to facilitate the development of electronic commerce by the introduction of measures which recognise the growing demand for encryption services to safeguard the integrity and confidentiality of electronic information transmitted on public telecommunications networks.

2. The policy, which has been decided upon after detailed discussion between Government Departments, involves the licensing and regulation of Trusted Third Parties (hereafter called TTPs) which will provide a range of information security services to their clients, whether they are corporate users or individual citizens. The provision of such information security services will be welcomed by IT users, and will considerably facilitate the establishment of, and industry's participation in, the GII, where trust in the security of communication has been acknowledged to be of paramount importance. The licensing policy will aim to preserve the ability of the intelligence and law enforcement agencies to fight serious crime and terrorism by establishing procedures for disclosure to them of encryption keys, under safeguards similar to those which already exist for warranted interception under the Interception of Communications Act.

3. The Government intends to bring forward proposals for legislation following consultation by the Department of Trade and Industry on detailed policy proposals.

2. Background

4. The increased use of IT systems by British business and commerce in the last decade has been a major factor in their improved competitive position in global markets. This reliance on IT systems has, however, brought with it increased security risks: especially concerning the integrity and confidentiality of information

passed electronically between trading bodies. The use of encryption services on electronic networks can help solve some of these security problems. In particular TTPs will facilitate secure electronic communications either within a particular trading environment (eg, between a bank and its customers) or between companies, especially smaller ones, that do not necessarily have any previous trading relationship.

5. In developing an encryption policy for the information society, we have also considered how the spread and availability of encryption technology will affect the ability of the authorities to continue to fight serious crime and terrorism. In developing policy in this area, the Government has been concerned to balance the commercial requirement for robust encryption services, with the need to protect users and for the intelligence and law enforcement authorities to retain the effectiveness of warranted interception under the Interception of Communications Act (1985).

6. Consideration by Government has also been given to the requirement for business to trade electronically throughout Europe and further afield. The inter-departmental discussions have therefore taken into account draft proposals by the European Commission, concerning information security (which include the promotion of TTPs), and discussions on similar issues taking place within the OECD.

3. The Government's Proposals

(a) Licensing

7. By their nature, TTPs, whatever services they may provide, will have to be trusted by their clients. Indeed in a global trading environment there will have to be trust of, and between, the various bodies fulfilling this function. To engender such trust, TTPs providing information security services to the general public will be licensed. The licensing regime would seek to ensure that organisations and bodies desiring to be TTPs will be fit for the purpose. The criteria could include fiduciary requirements (eg, appropriate liability cover), competence of employees and adherence to quality management standards. TTPs would also be required to release to the authorities the encryption key of their clients under similar safeguards to those which already exist. We would expect organisations with existing customers, such as banks, network operators and associations (trade or otherwise) to be prime candidates for TTPs.

8. The Government will consult with organisations such as financial service companies, who have made existing arrangements for the use and provision of encryption services, with the intention of avoiding any adverse effects on their competitiveness. It is not the intention of the Government to regulate the private use of encryption. It will, however, ensure that organisations and bodies wishing to provide encryption services to the public will be appropriately licensed.

(b) Services Offered

9. The services which a TTP may provide for its customers will be a commercial decision. Typically, provision of authentication services may include the verification of a client's public key, time stamping of documents and digital signatures (which secure the integrity of documents). TTPs may also offer a service of key retrieval (typically for documents and files that have been encrypted by employees) in addition to facilitating the real time encryption of a client's communications.

10. Licensed TTPs operating within a common architectural framework, on a European or even a global basis, will be able to facilitate secure communications between potential business partners in different countries. Providing the respective clients trust their TTPs, secure electronic commerce between parties who have not met will become possible because they will have confidence in the security and integrity of their dealings.

(c) Architecture and supporting products

11. It is envisaged that a common architectural framework will be needed to support the information security services being offered by TTPs in different countries. Clearly this will be a matter for negotiation between interested parties taking into account developments in international standards organisations. The architecture would need, however, to support both the provision of *integrity* and *confidentiality* and therefore be capable of verifying public encryption keys and escrowing private ones. There is no reason why it should not also support a choice of encryption algorithms, such as those on the ISO (International Standards Organisation) register.

12. In support of such an architectural framework we would envisage manufacturers developing software or hardware products for use by the business community. Such products will need to be consistent with whatever standard (or standards) are arrived at to enable TTPs to interoperate. The type of algorithm used for message encryption, and whether it is implemented in hardware or software, will be a matter of business choice.

(d) European Union

13. The Government is working closely with the European Commission on the development of encryption services through their work on information security. Arrangements concerning lawful interception and the regulation of TTPs in that context are matters for Member States to determine. However, the Commission has an important role in facilitating the establishment of an environment where developments in the use of TTPs can be fostered. The Commission should soon be in a position to bring forward a programme of work involving, for example, the piloting and testing of TTP networks.

(e) OECD

14. The Government are also participating in discussions at the OECD on encryption matters. Where possible we will encourage the development of networks of TTPs which facilitate secure electronic trading on a global basis.

(f) Export Controls

15. Export controls will remain in place for encryption products (whether in hardware or software form) and for digital encryption algorithms. However, to facilitate the participation of business and commerce in the information society the Government will take steps, with our EU partners, with a view to simplifying the export controls applicable to encryption products which are of use with licensed TTPs.

4. Consultation

16. Officials from the Department of Trade and Industry have already held preliminary discussions with various industry group on the general concepts surrounding the provision of encryption services through TTPs. A more formal consultation on the Government's proposals will be undertaken by the Department of Trade and Industry with all interested parties prior to the bringing forward of legislative proposals. The Government recognises that the successful facilitation of electronic commerce through the introduction of information security services by TTPs either in the UK or in Europe will, to a significant extent, depend on their widespread use across business. It will therefore be important to secure the broad acceptance of the business community for the Government's proposals. The Department will pay particular attention to this during the consultation process.

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June 1996

Examination of Witness

Mr Ian Taylor MBE, a Member of the House of Commons, Minister for Science and Technology, called in and examined.

Chairman

1006. Good morning, Minister. Thank you very much for coming to see us. We are glad to see you and are very appreciative of the interest that you take in this subject. Thank you also for the copy of your speech in the Commons on the year 2000 and the curious problems that that brings. A copy of that has been circulated to members of the Sub-Committee, but if you would like to add any further short remarks on that we should be grateful to hear them before we embark on questions. If there is anything else you would like to say by way of introduction, please carry on.

(*Mr Taylor*) That is very kind, my Lord Chairman. I think the subject you are looking into is absolutely riveting. The potential is enormous, the implications for economic and social life are extraordinary and beneficial as long as we capture them. The United Kingdom is in a very good position to capture them. In many areas we are ahead of the United States. In other areas we must regard the United States as the benchmark and up our challenge. The whole movement of industrial investment indicates just how much overseas companies value what is going on in the UK because of the big inward investment which has led to considerable research and development in the United Kingdom by overseas investors, for example in the development of the GSM system. Enormous potential is there. I want to see it spread to every corner of the country but that has to take place within a competitive framework. The Government should set that framework, make it clear, regulate it (I think you are seeing the Director General of OFTEL later), have that as a clear and stable regulatory environment, bear down on anti-competitive practices wherever they might emerge and encourage market entry whenever it is possible. We should also conclude such agreements as are possible to keep the UK in the lead, such as the one I have recently done in anticipating possible moves by other countries in liberalising international telephony, moving across the whole spectrum for international telephony and liberalisation in the UK by offering more licences than are available to date, which have been confined to the duopoly of BT and Mercury. Those are the sorts of things that really are well worth discussing. I am very glad that there is now a wide consensus that we are talking about a

Chairman *contd.*]

network of networks. Sir Peter Bonfield, who is bringing his service industry background in that sense to BT, has made that point very clear and has openly welcomed it and accepts that that is the competitive environment that we are going to be working in. You mentioned the millennium date change. It is something that greatly concerns me. By and large I seem to be one of the people that has to raise the issue generally, and yet when I do raise the issue people react and say, "Yes, this may be a problem", but I do not think it has yet penetrated the thinking at the highest levels in companies. The Deputy Prime Minister is appraised of the fact but he was surprised, given all the time he spends with chief executives of companies, not least in aeroplanes, that it was raised with him by a minister at the DTI and by the CCTA and others within government. I do not want to create a panic. What I do want to create is a series of action plans as early as possible to deal with what is a genuine problem, the extent of which—and I am not prepared to speculate figures—we cannot identify and I suspect that many companies will not identify until they start to work through their own systems. The sooner they do so the easier it will be in terms of cost and the more likely it will be that they will have the sort of programmers that can delve into some of their hybrid systems to look at this click-click-0-0 problem.

1007. Could you elaborate a little on your remark that in some areas the UK leads the USA, apart perhaps from the fact as I would see it that our regime is a little more liberal than the one introduced by way of their recent Telecommunications Act?

A. We do get lectured occasionally from our close American friends on the importance of liberalisation and open markets and they tend to forget exactly what they have just told us as soon as they get back into Washington. The stalling of the WTO talks was a classic example of that. The failure yet to declare BT and Cable & Wireless non-dominant is an intriguing position bearing in mind that AT&T is apparently non-dominant. There are many things that Americans must look to in order to put their own house in order. We have decided that the best way of encouraging the Americans to understand their own philosophy is to lead and we have done that in the way that I have just described, through liberalisation of international telecommunications. We hope that will encourage them to be more forthcoming. There are genuine areas where, if you talk to NYNEX, if you talk to TeleWest or to Cabletel and others, we have pioneered the merging of broadcasting and telephony that is beginning now to happen in the States. But a lot of the pioneering work by those companies has been done here, which of course has benefited the UK. When you get now the shifting alliances that have been unrolled in the cable industry as consolidation has taken place we have had the great benefit of having had these American and Canadian companies over here. But in the precise sense of Americans testing out technology which they have not done at home or not had a chance to do at home. The other area is BT. BT's interactive television trials in Colchester and Ipswich exceed by a massive margin anything that has yet been achieved in the United States.

Lord Haskel

1008. I was very interested in what you had to say about competition and British Telecom because we have had it put to us that the Government's constraints on British Telecom have impeded the interests of UK firms regarding the worldwide manufacturing of information superhighway infrastructure. The point that was made was that there is little incentive for the cable companies to provide an information superhighway since there is no competitive pressure for them to do so, and that it is unlikely that they will risk this investment without regulatory requirements.

A. I do not think, if you talked to the cable industry, that they would regard themselves as without competition. Satellite is becoming more and more interesting and satellite is competition. But of course the trigger points in so many of these market situations mean that what does happen in the competitive market will determine the rate of change. BT is a much better company, much more efficient, much more innovative, and I would argue much more successful, in all the areas where it has faced competition. In areas where it has not faced competition it is rather sluggish and uncompetitive. ISDN lines: until this year "ISDN" has meant "it still does nothing" as far as BT is concerned. I have the highest regard for the way BT has responded to the competitive pressures. For example, the rather quietly announced decision to upgrade networks to 88,000 kerbside boxes to fibre rich and probably full fibre content cabling is indicative not of any deal that they might have done with any organisation in the political world, but the fact that in the local loop competition is growing. The cable industry will make its final move probably to all digital when satellite itself starts moving to all digital. They will be upgrading. As far as the effect on British suppliers is concerned, we can trade figures and it may be different in individual company senses, but overall the UK manufacturing base has benefited enormously from what is going on in the UK. I visit many of the companies that are providing on-line services as well as switch equipment etc, which have done remarkably well through the investments made. Do not underestimate the impact of the cable industry's investment in the UK. Even if you were to exclude the fact that we have kept many construction companies in work during the recession through our cable policy, which is not a negligible impact, nevertheless in the equipment supply industry, ranging right from BICC through to the various technical switch and head-end operators, the cable industry are investing over two billion pounds this year. If you take all the telecoms companies, they are investing about £2.7 billion which is the equivalent of what BT is investing, so it is a huge impact into the UK.

1009. You do not think there is a role there for the regulator to encourage either BT or the cable companies to think that competition between satellite and the cable companies and satellite and BT will create the information superhighway?

A. Clearly there is a role for OFTEL in the event that the competitive situation is not working. If you for example have cross-subsidies or whatever in any

Lord Haskel *contd.*]

one of the particular players or unfair access conditions, that would be a matter for OFTEL or OFT, as the case may have it. OFT has an enquiry going on into certain aspects at the moment. What I am saying is that competition has stimulated the market. We are well beyond the thought that there has to be one monopoly supplier of the infrastructure in order for there to be a superhighway. I have already mentioned Sir Peter Bonfield's open acceptance of networks in that way. Of course in the future you will see much more interesting alliances developing embracing also the broadcasting industry. We do not know how many of these things are going to take place. One plea I make to the Sub-Committee is at least to share with me when you hear people talking about vision, that that vision is unlikely to be precise because we do not yet know whether the final platform is going to be the personal computer or the television or both, in what ratios, what the ultimate success factor will be, whether it will be terrestrial, broadcasting, or digital, whether it will be the use of the Internet for broadcasting, how satellite will link in, how the terrestrial channels will ultimately use satellite as well as terrestrial television. In other words, my job is to stimulate the market, but it is almost impossible to see exactly how these factors will play out one to the other. That can only take place in a liberalised competitive market.

1010. Do you see a target date when the availability of the information superhighway will be here?

A. It is there now. That was what I call the Jeremy Paxman question on Newsnight: "Minister, when will the superhighway be opened?" as if the Queen is going to come down and cut the ribbon. It is like saying you have not got a road simply because you can only use a Morris Minor rather than a Ferrari. The reality is there. You can access the Internet on the telephone. It can be pretty jolly slow sometimes, but the idea that every user of the superhighway needs full broadband shoved through his front door is crazy. Indeed, we are realising some of the great flexibility in the way that the systems are developing in Integrated Services Digital Networks. I have already made the point that I would like them to be at a more realistic and affordable price, but ISDN is wideband.

Lord Flowers

1011. Forgive me, Minister. If you want interactive video type access you need a genuine superhighway and not the slow lane which we have at the moment. I think the question has just been asked about target dates for the superhighway representing the broadband access. We have just come back from the States. It is quite clear that the real development of these things will depend upon broadband access.

A. I profoundly disagree with your statement. My objective is to have broad band covering the whole country at some point in the future, but my point is that it is also going to be by application pull. For most people they are still getting used to what is possible if they can get ISDN, which of course is a wideband system, using technology that has progressed quite extraordinarily. The sort of things you can do with the humble copper wire now with compression technology is quite extraordinary. My point is that you and I do not differ about the vision that long term the probability is that it will be a fibre optic network, but even two years ago it was thought that you could only have interactive services if you had fibre optic into the front door. We are now finding that compression technologies are quite acceptable further and further away from the home. All I am saying as Minister is that if one is responsive to what is happening in the industry the cost effective nature of the way that the superhighway is developing is really quite extraordinary and I do not want to pre-ordain or even tell people that they are not going to have something simply because they have not got fibre optic cabling. You will blow your mind on some of the applications you can use on ISDN from your home. If you are a business it is easier to get on to that network and of course increasingly high usage customers are finding ready access to the advanced systems. Asynchronous Transfer Mode is being put in quite a lot by the people who really need genuine broadcast video quality pictures.

1012. You are absolutely right. It is possible to get a lot of effective broadband access through short distance narrowband transmission methods. It is perfectly true, provided that most of the backbone of the system is fibre optic, that you can do that and BT deserve a lot of credit for having shown that you can do that. Let us not argue about the technology. What we would like to know is whether the Government has any sense of a timescale for broadband communication to take place into small businesses as well as large, into the home as well as into business. I do not mind whether there is a twisted pair at the end of the line provided it does not interfere with the communication.

A. We have not so much a target date but a series of schemes for trying to accelerate the takeup, the Information Society Initiative which we have sent details about. It is designed to encourage more firms to realise why they should be involved in electronic commerce. If they start to realise that then the supply of broader band communications to enable them to do it will follow. Telephone companies will very happily supply it, either regional companies or cable industry companies or BT or Mercury. We have to stimulate the awareness of what businesses could do if they were to have it. That is why the ISI initiative is taking place. The cable industry has got a fibre rich system which you can upgrade very quickly, using now the twisted copper pair for telephony and co-axial cable for the telephone services. I have already mentioned that they may be well stimulated by digital satellite broadcasting and I envisage that happening fairly soon now. The cable industry's own build rates in their franchises would mean that probably, even if we were not to let any more franchises, 73 per cent of the population would be covered by the year 2001, and I suspect that we will launch more franchises so our target is about 85 per cent. For those regions which are not likely to get cable because of geography we have released some 10 gigahertz radio spectrum which is ISDN equivalent in terms of capacity. I think the Government is

Lord Flowers *contd.*]

working to make sure that by the beginning of the next century the bulk of the UK population will have access to the potential to satisfy their demand for wideband and broadband technology. By that date in any event I expect further advances to be made from satellite communication downlinks to personal computers.

Lord Gregson

1013. The question of the 85 per cent possibly covered by cable does mean that 15 per cent will be excluded. The suggestion is that this can be dealt with by the bandwidths you have released on the radio. Our information is that it is not really at that bandwidth that you get the comparative communications capability. At the same time there is another 15 per cent who cannot get satellite because they have hills in the way and the satellites are too low to come over the horizon to make reception possible. There are large chunks of population who, despite the claims you make, are not covered. There is no commercial incentive to develop the 15 per cent. Should there not be some government incentive like a feeder station to make this possible? No commercial activity will cater for the 15 per cent.

A. That is a rather positive and clear statement, that there is no clear commercial incentive. My instinct is that as technology advances there are plenty of people who realise that marginal access is quite profitable. For example, I heard predictions at the time that privatisation of BT was going ahead that that was the end of universal coverage. In fact coverage of the telephone has gone up from 78 per cent to 92 per cent of the population since competition came in. I am just a little bit cautious about the absolutes. However, you are right. There are bound to be sections of the community that will find it more difficult and I think the Government does have a role in stimulating that coverage. I know of the discussions which the Director General of OFTEL is having with the industry on a voluntary basis to see whether we can get some voluntary arrangement for upping the universal coverage. You may well want to cross-question him about that. I think it is better done through the framework which he is setting up than through government dictat. It is also better to be done on a voluntary basis for a rather important reason, which I am watching very closely in other European countries, that if the Government sets an artificial entry point for universal service cost at a higher than basic telephony point, then you are effectively making the market entry of new companies that much more difficult. You can well see that in a country that does not want to liberalise that is a temptation.

1014. When you say that OFTEL can better discuss this, does that mean that OFTEL are free to allow BT to help in this situation? They have the capability of helping another 10 per cent so you have only got five per cent left in effect, or is that a mistaken view?

A. No. BT has pretty well universal coverage of the UK. The shortfall in numbers of population that do not want a telephone quite often is for financial reasons, not for geographical reasons.

1015. The real problem here is that they have not got a telephone within easy reach of a fibre optic box and that is the fundamental problem.

A. This is the problem. We have to be very careful about using these figures, with respect. One of the most interesting things is that the cable companies, which are by definition in urban areas—that is where the franchises have been—have found that up to 10 per cent of their telephone subscribers are first-time subscribers. It is not because they could not have got a telephone before. It is the cable companies that have come in and offered them an understandable and competitive package which has made them think for the first time that it was worthwhile having a telephone. When we talk about universal coverage we should not just assume that it is somewhere in remote parts of Scotland. It could well be down the road here in Westminster that someone has not got a telephone because there has been a price impediment, and competition has got over that in quite a remarkable way. What I want to look at is the way that technologies can help and I would stimulate BT to activate the market using their existing networks. If you go back and look at the Command Paper I issued in November 1994, that did invite BT with its existing networks to look at the as yet unlet franchises and come forward to bid for them. They have chosen not to do so. That is a commercial decision, not a political one. BT is hardly restrained at all, despite some of the claims that have in the past been made. The only thing that it is not allowed to do is to set up a national network simultaneous broadcast system.

1016. But some of the franchises that have already been let include areas within that franchise that will never be covered by cable.

A. But that is why we are encouraging the use of radio spectrum, for example for the telephony. We have just released two gigahertz radio spectrum for the rural areas and we have also licensed Ionica which has just started its service in East Anglia—it is a national service which started locally, and also Liberty—to provide fixed point radio telephony services in competition with cable and with BT and Mercury. We are aware that technology can find a way of solving problems and we are trying to stimulate the use of the different technologies and giving different players an opportunity to get involved in them. BT is one of the companies I recall that has been successful in gaining some of the two gigahertz spectrum.

Lord Craig of Radley

1017. You characterise one of the Government's thrusts in all of this as being that you are anxious to accelerate takeup. You quote the very attractively presented Information Society Initiative document. I would like to come back to that in a moment. You also make the point that network upgrading is easy. In other words you are looking to people demanding services to get the upgrades nearer to the superhighway. What are your views about overloading of the network and people finding that what they hoped they would get, what they are led to believe they would get, is actually not as easy as they

Lord Craig of Radley *contd.*]

would wish? When we were in North Carolina last week we were given a very strong message which was that all the various departments in the state who had an interest in IT should pool their resources and get together with the commercial companies to install a Superhighway, which then found all sorts of unexpected and new uses because it was there. I am not suggesting they are right or that you are wrong but I think it is important for us to understand why you believe it is absolutely right that the customer push is the way to get this thing established because if we do not get that right we could find ourselves out of step with the North Carolinas and others.

A. I doubt that because I just see the vibrancy of what is going on in this country and I think some of the people in North America see the vibrancy of what is going on in this country as well. Let me give you a straight philosophical answer to part of your question. Instinctively I doubt that if we provided a monopoly, whoever owned it, as the background of the infrastructure, it would be as innovative as it would be if provided by a variety of contributing companies, and that therefore competing interconnecting networks are the right way forward. They have stimulated things in this country which we did not believe to be possible. The second part of your question about capacity is a very serious one indeed, but it does not lend itself necessarily to just a UK solution. For example, one of the biggest problems on the Internet is what happens when America wakes up. If you are an Internet surfer you might as well get it all over by breakfast time here when America has gone to bed hopefully, but do not do it in the afternoon. That is not something I can solve. One of the interesting points of blockage is the refusal of the American authorities openly to discuss new cable landing rights in the United States. If you talk to Cable & Wireless they would be happy to put one in tomorrow. It might take them slightly longer than 24 hours, but they would certainly announce their decisions and therefore reduce some of the capacity constraint. I had this dispute too in South Africa with the G7 developing countries. I was being berated by one minister—I hope you will not ask me who it was—who on the one hand said that he had got lots of great ideas but it was the nasty G7 countries who were denying him the benefits of the information superhighway. I fortunately hit on the right question to ask him because I said how many downlink and uplink points had he in his country. "Oh, we only have one", he said. I said, "You do not have multiple ones?", and, "What sort of pricing do you have?" "Oh, that is priced very high because these companies can afford it." If you think about that, satellites have a universal footprint, or at any rate a broad geographical one, and if that country was really determined to be on the Internet, it would allow multiple satellite points and it would very competitively price up and down links to encourage service companies to come in. That sort of debate with a developing country could rapidly come here. We need to make sure that the competitive market brings down prices and gives people access, that we stimulate people to realise what they could do, that we stimulate the convergence of multi-media industries and get them to have the confidence to come on line, and I am sure you will ask me about intellectual property. The whole of that process then enables a pull-through and encourages investment on competitive commercial terms for companies like BT, Mercury, Energis, Torch, MFS. I recently opened a head-end for MFS in London, and they cannot invest fast enough. They are six times the size that they thought they were going to be at this stage of their business because demand is pulling them through.

1018. Can we go on to the Information Society Initiative and this certainly is a very attractively put together series of pamphlets? It is of course targeted very much at business, small businesses and those who do not yet have the knowledge or the experience and need someone to point the way ahead to them. Perhaps you would like to explain to us how the Information Society Initiative is going to help get the public more widely aware, get local governments and local government departments more aware, because we get told from time to time that the Government must lead, and then government must only be an umpire. I think there is probably a role in both those regimes. What about leading more widely the public, and indeed perhaps I should mention schools in this too?

A. As a Conservative Minister of course I believe in a mixed economy and therefore government does have a role to play in this. The Government's role should not be to stimulate the monopoly supplier, which is a point that the Leader of the Opposition did not understand. In terms of what we are trying to do, you have to introduce it in phases and in a sense it is a question of capacity of officials to generate programmes which are quite manpower time intensive. That is a bigger factor than sheer money in many cases. Because we are dealing with new technologies knowledge has to be learned as well. I am very satisfied about the DTI. Officials do not often get praise but I would like to praise my officials, not least because of the rapid way they have responded, I would like to think to prompting from me as well as others, to realise that the DTI had to be radically reorganised in order that people reacted to multimedia rather than having central vertical divisions which did not talk to each other. We have now got the communications and information industries division in the DTI which is pulling all of these sectors together so that music and publishing and broadcasting in the economic supply chain sense, and multimedia in computing and telecommunications and all these things, are all in the same division with the same objectives. That has enabled us to launch the Information Society Initiative. I had to get that right before I could launch it. The second thing is that we wanted to work closely with industry. There is no point in Government announcing initiatives if it is not engaged with industry. It took us quite a few months to get industry sufficiently reactive as to what they wanted it to do and how we would best organise it. That we did and we got a very favourable launch with companies ranging from BT at the big end to very small companies at the other end, software as well as users. The process of encouraging British industry is again a complex one. There are some companies for whom even a personal computer would be quite a

Lord Craig of Radley *contd.*]

large step forward. We must never forget that we live in a very diverse industrial society. I have tried to have a programme which encourages them to realise that even just having a personal computer for spreadsheets is quite useful. Then there is an intermediate stage where they have got computers but do not fully use them, and why proper use of them can turn a sequential process into a simultaneous one, which often can save not just days but weeks if they are going back and forth to the suppliers or co-designers or whatever else they do. Then onto the really sophisticated users of EDI and all the video-conferencing and other potentials where they are constantly looking to upgrade. The Business Links around the country can help, together with the Information Technology Counsellors who have now been appointed. We are doing demonstration programmes, we are issuing challenge competitions for creativity and better use of software. I think we are beginning to be ready now to build on the Information Society Initiative to try to reach not just the businesses but people working in the businesses or at home, or through public access points. So we are talking again with industry to see what is most interesting to them, again not trying to pre-ordain the one solution, because a lot of businessmen have invested a lot of money in industry in what they are trying to do, in proprietorial solutions. We want to encourage all of those to flourish and to provide the right framework. I think you will find over the next month or two more announcements in terms of broadening the Information Society Initiative so that it embraces public access points, encourages the programmes that at the moment are already in the market. Many companies already run public awareness programmes, incidentally, and are using them in companies, for example the integrated learning systems that have been used in schools and adapting them for in-house company training because it is absolutely crucial to increase the skills base in our business in this country. The final part of the jigsaw, as you rightly said, is schools. Michael Heseltine and I launched the Information Education Superhighways last November in Cambridge. That is a £10 million Government evaluation of about 23 collaborative projects put forward by industry and that is making good progress. In addition we have got the DTI Schools On Line project, which is trying to get better use of Internet for schools and developing software packages at the University of East Anglia, and that has been very successful. We are moving very quickly and encouraging work done by the Federation of Electronics Industries and proprietary systems such as BT's excellent "Campus World", the Cable Industry's "Schools Without Walls Concept". I think you will find that these will be increasingly deployed by schools across the country over the next year or two and we are stimulating that. It is essential that children get computer literacy but also essential that children realise the remarkable way that information technology can increase their desire to learn and their ability to retain knowledge.

Chairman

1019. Is my understanding on part of that, Minister, that the DTI is pioneering the use in government of intranets and so on?

A. In government, yes. I am not sure that that was necessarily the point I was making in my previous answer. If you are asking about intranets in government, yes. In fact, you could say that the DTI, for example, now it has deployed its Osprey system, has over 3,000 people using E-mail constantly. If an official wants to get to my office he will E-mail the private office. The point about an intranet is that by definition it is secure and therefore the gateways outside to the Internet have to be very securely monitored. I have an E-mail address which is not on the Osprey system for that reason, although it can relate into it. You will understand that from a security point of view. The growth of intranets is going to outrank the growth in Internets in my judgment because they have the flexibility for internal security. The software programmes for intranets are growing enormously as one can see by going to any of the exhibitions that are being put forward. The Government, now that it has set up the Central Information Technology Unit at last, which gives us a core group in government, is able to co-ordinate what is going across all government departments.

Lord Flowers

1020. But is that because of nervousness about security and the use of encryption and so on rather than something else?

A. No, but you would be right to say that that is something of which we are rightly nervous. The DTI holds some very price sensitive information on computer. This need for security is a general warning. We have published as part of the Information Society Initiative clear guidance on security of systems. There is no point in investing in information software and technology if you do not take good care of it, so security is an important lesson, and it is an important lesson for government. The reason for the Central Information Technology Unit is much more positive than the negative aspect, and it is that government is one of the largest purchasers of information technology. It is also one of the largest users of information technology and we have one of the largest client bases, the public. It is and has always seemed to me to be axiomatic therefore that a government which encourages electronic commerce in its dealings with the public will encourage people to want to deal electronically themselves. I envisage in the near future any application to any government department for anything being capable of being done electronically, that you would be able to E-mail any government department, and through public access points you would be able, through kiosks for example, increasingly to conduct transactions with government on pensions or benefits or whatever. Indeed, the benefits office is trialing successfully a kiosk in its Bournemouth office at the moment and that experiment will be extended. Therefore we will have in only a year or two a much broader understanding of the electronic role of government and the Central Information Technology Unit is crucial, not least for example because validation is important, integrity is important, so you have to have systems which give the public confidence that

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they are talking to the people they think they are talking to when they communicate.

Chairman] That is something that we have worried about.

Baroness Hogg

1021. That does lead to a group of questions which are internationally based. You mentioned in your evidence the Government's proposals for the licensing of trusted third parties. All these systems that are being explored for encryption and authentication will presumably only be of real use if they are agreed internationally. Do you see difficulty in reaching agreement at G7 level on the suitability of encryption agreements of this kind, whether it is escrow or trusted third parties? Is there a divide opening up here between G7 countries and European governments?

A. I think there could have been a problem with the United States if we had not come forward with our proposals and encouraged the debate. Before I get to the G7, I think the European Union is rather crucial and therefore by announcing our plans we hope to take a leadership position in the European Union as to how they may see their role forward. Bear in mind that that is a market about half as big again as the United States, so the European Union is a rather important factor. I was getting a bit concerned, to be truthful, about the way that if we were not careful proprietary systems in the United States could be exported and they would then set the whole world standard. I moved very quickly to announce the trusted third parties route. There will need to be talks between governments and of course industry will need to think how they best can move forward. What we wanted to set out was a framework which we think is likely to meet the needs of industry and likely to find a broad acceptance in other countries with the trusted third party approach. Ultimately encryption systems will grow in electronic commerce for security purposes, but for people to be able to communicate using encryption they need to know that the people at the other end can understand what they have encrypted. Therefore you do need something like a trusted third party network. I rather suspect that the Americans, who are sometimes thought to be world leaders in so many of these things, actually sometimes end up with egg on their faces when they do not think through plans and the clipper chip concept and all that has really hit the buffers. We have come in just at the time when they are opening up their minds again.

1022. But the issue of government intervention for a system of key holders: do you see that as an inhibition?

A. This is a hugely sensitive area and the balance between the interests of the commercial sector and the private individual and governments is one of great delicacy. I do stress that the trusted third party route will not enable people to tap into the encrypted messages. The trusted third parties will be holding the keys. They will be part of the key management operation. They cannot listen in to what is going on. They are separate from it. They may be banks or institutions used to having the trust placed in them for the security of information. Under our proposal they will be licensed so they could be a wide variety of non-governmental sources. It is possible that the government will have its own internal system but I have no intention of marketing that system. Our own trusted third party system is the sort of government protection we want but I think this is a matter where the private sector can be seen to have a role to play.

1023. Another international question which has arisen recently is the US effectively pulling the rug from under the WTO agreement and the liberalisation of telecommunications. Would you like to share with this Sub-Committee your thoughts on where we go from here, assuming we do get a breakthrough next year after the end of the US electoral cycle, or have we hit the buffers?

A. I think the chairman of the detailed negotiations, Neil McMillan, who is a DTI official, did a valiant job in attempting to get unity on the detail. There was a series of factors which led to the setback. One was European. The unfortunate democratic vacuum in Spain at the end of April—which is not an attack on Spain in case this is misinterpreted here; it is a statement of fact: there was not a government in Spain and the outgoing government could not commit the incoming government and it was anyway a sensitive issue—led to there not being agreement at the Council of Ministers that I was present at to improving the European Union offer. However, that was not the reason for the talks being stalled. The real reason was the rather strange behaviour (which I think has to be counter productive) of the American delegation in seeking a last-minute change in the rules that they were prepared to play to on international liberalisation and ownership and on satellites. I think that was very unfortunate. I have made my views plain in no uncertain terms to those American companies operating in our genuinely liberalised market that their parent companies may not have had sufficient time to consult the UK associate or subsidiary companies about what a liberalised market really looked like. I hope they will have had time to do so when the talks regain momentum in the autumn and probably formally in February. The offers are still on the table. I would hope that we can use productively the unexpected time to encourage some of the Asian countries either to come forward with offers or improved offers. There is still some work to do in South America and I would like the European Union offer to be better than it currently is. I know that Sir Leon Brittan and Martin Bangemann share that view.

1024. A third question in this area that you touched on earlier is the question of intellectual property. What can the UK Government do to ensure the implementation of its approach to adopting legislation more widely?

A. Again the European Union is crucial. It is important to realise that in so many areas that I deal with the Commission is our friend. We need a strong Commission. Obviously there are occasions when I would disagree with detailed proposals and suggest they are amended and other occasions when I would actually ask for some of the proposals to be speeded up. By and large we have a very good framework of

Baroness Hogg *contd.*]

agreement with the key commissioners involved, Mario Monti, Martin Bangemann and Karel van Miert. The area of intellectual property is very complicated to deal with. It can only be dealt with cross-nationally. The European Union at the moment has got problems with one member country which has a terrible record on piracy of music. We are trying to do something about that. That is within the European Union. We have all been watching what has been happening in China recently. Ultimately we have to make sure that something like the World Intellectual Property Organisation and the TRIPS agreement with the WTO are effective and binding and can be enforced. This is a question of ceaseless observation because frankly the one impediment to the Information Society becoming really successful is not capacity. It is a worry by the content providers about the content that they can allow to go on it. That will increase the use of intranets so that you know who is going to get access to the material you have just put out. Although I think many of our laws are in place in the UK and at the European level and things are going in the right direction, it is observance of the laws and how you pull up a country that is being less than compliant in observing those laws that is the problem.

1025. Does that imply that you are reasonably confident that the UK approach to the ownership of copyright is one that will receive endorsement at the European level? It has been put to us by a number of witnesses that the European approach as a more diverse approach to the ownership of copyright is a worry in the relevant sectors in the Internet and if that approach were to become a universal approach that would be an inhibition on the growth of this area.

A. There are elements of that question which do concern me. So far sensible negotiations are prevailing. The difficulty—you have seen this in the art world as well—if you impose a system which is incompatible with the new flexibilities of the market is that you are going to hold back those markets or you are going to invite abuse. The same will occur in the other areas of content which is going on the superhighway. The negotiations are really to try to get the most flexible form of recognition of the entitlement to copyright rather than having to go through a rather tedious and bureaucratic system of tracing the first interested party. I am well aware of those debates and I am well aware of the sensitivities in other countries which have not been as open as we are. I am also well aware of the interests of owners of copyright and fees in the UK that they perhaps do not get as good a deal as some of those on the continent, so it is a constant juggling of the balls to try to get something compatible with the new electronic superhighway and the interests of the content providers. I think it is going in the right direction, but I am not proclaiming success and I have already warned about where we are going to have problems even if we get the rules agreed. The one area where I think we perhaps have not yet fully seen developments is watermarking. There are now technologies available, even in digital recordings, to watermark which are in no way audible without equipment, but equipment will enable non-watermarked recordings to be identified, and I think that the industry in that sense is responding through technology to the problems which it recognises.

Chairman

1026. Still on the question of Internet content, is the Government going to press G7 to adopt the PICS standard (the Platform for Internet Content Selection)?

A. Again I love the fascination with G7. Can we start with the European Union please which is a legal entity? That is something we can cope with if we can get it agreed. However, of course G7 is important because it involves two of the key countries, America and Canada, and also Japan. I would like to raise a warning about the whole content aspect of the Internet. Governments are prone to take action often because of public pressure, but would be wise to consider that their action is likely to be nullified by the origins of the Internet itself in that it was designed to avoid and survive a nuclear attack. It is likely to be fairly resistant to government legislation. Governments can get slightly embarrassed if they try to take a moral majority position which then clearly does not have an effect. That is over and above questions of freedom of speech, which is a debate I am sure you entered into while you were in the United States because it is going on at this very moment with various law judgments that overturn attempts to legislate in the States. I think the framework in which we approach content on what are anarchic and global networks, and I use the plural, has got to be carefully thought through. Bavaria found, although it got a lot of high value publicity, that actually it did not do what it wanted it to do because anyone with access to the Internet, even with CompuServe, could get access to material which the Bavarian government did not like. Presumably, in my judgment, anyone that wanted that information was sufficiently capable of understanding how you surfed around government legislation. Other countries will find that if they try to run a blanket abolition of news groups. Therefore I have worked hard to try to get the Internet service providers to come forward with voluntary codes and the PICS is one of those codes which would enable somebody who wanted a limitation of certain categories to programme his PC or the school's PC or the firm's PC to eliminate the categories that were not wanted or all those ungraded categories which have not yet been assessed. I like that system. I would warmly encourage further work on it. It may not by itself be sufficient. It may well be that others will come in. It is not so much that I am trying to get legislative proposals on the table. What I am trying to do is discuss, let us say with my German opposite number who is taking a similar interest in how we constructively deal with the difficulties, how to make it a voluntary system of self-restraint where the Internet user, when acquiring a PC which is attached to the superhighways through a modem, is capable of making his or her own judgment as to what use they want to make of it. I think that is the only safe way forward. One final point. Anything which is illegal is

Chairman *contd.*]

equally illegal on the electronic superhighway and nothing that I have just said should in any way imply that I am not encouraging the police to take action where there is a genuine case of illegality on the networks. I am glad to see that the police have taken action in more than one paedophilia case.

Lord Gregson

1027. Minister, you have the problem of security and encryption used by firms for subscription purposes on television. We shall have to widen it on the Internet because there is no other way of paying for the damn thing unless we have some sort of subscription. It appears it is not at present an offence to avoid such encryption in the UK. Is it something the Government really ought seriously to look at? I know it is an offence to use it for fraudulent purposes, but it is a long way down the line, to avoid that sort of situation in America where the best game in the sixth form is of course hacking. It is so widespread, and the most tight Internet system in the world, the DOD, has been hacked over 2,000 times this year already. There is a fundamental problem building up. It starts really with the fact that it is not an offence to hack unless you use that hacking for some other fraudulent purpose.

A. I know my former colleague Emma Nicholson was very exercised by that issue and the Government is looking, and constantly looking, to stay ahead of the hacking fraternity. One of the best ways of doing that is to alert companies to the dangers that can come from those processes and to build in security systems, gateways—the Chairman's point about Internet and intranet again. My blunt rule is this, the Internet is a publicly available non-secretive network of networks and you can have enormous fun on it, you can have vast access to information, but do not put your personal secrets or whatever else on to the Internet if you do not want someone else to read them. That means that we will increasingly be seeing encryption coming in which is why I brought forward the proposals for trusted third parties. However, at the same time do not panic about the things that you do not panic about in other forms. For example, my Lord Chairman, you may go out of this room and go across to the shop and give your credit card over to the shop assistant and you will leave an imprint of your credit card and your signature and you will not ask for it back. We have got to realise that what you do electronically with credit cards is in that sense a risk that you are prepared to take in the commercial world. You have got to get the balance right for that.

1028. There is the avoidance of subscriptions and that is now widespread. You can buy the black box, as you probably know, and it is not an offence.

A. We are looking at that in the overall field. We are looking at all of these things as the technologies develop. The clear point is to try to find a level in which commercialisation of the networks can come, where people can use them and make money. Increasingly what is happening is that people are putting free information on the Internet and then inviting people to come back if they want to do transactions. At that point you start to get into encryption, but there are commercially available forms of encryption—

1029. And they are being avoided and it is not an offence to avoid them.

A. I appreciate that, but we are looking at this issue quite carefully.

Chairman

1030. I am afraid, Minister, that we have one great enemy on this Sub-Committee and it is time and we have run out of it yet again. Can I say thank you very much indeed for that very informative frank account. If you have anything else you would like to say to us, we would be very glad to hear from you, but, in the meantime, thank you very much indeed.

A. Thank you very much. As technology is advancing so fast, if we come up with another whiz-bang idea I will certainly make sure that the Committee knows. I have recently penned a pamphlet on this issue and, if Lord Nolan would not object, if Members of the Sub-Committee would like a copy then I can provide them with one.

1031. No doubt the situation will have changed when you return to your office! Thank you very much.

A. Thank you.

Examination of Witnesses

MR DONALD CRUICKSHANK, Director General, MRS ANNA WALKER, Deputy Director General, MR PETER WALKER, Technical Director, Office of Telecommunications, called in and examined.

Chairman

1032. Good morning, Mr Cruickshank, Mrs Walker, Mr Walker. Thank you for coming to see us again. I think you were the second group that appeared before us and you are now the penultimate group to appear, so make what you like of that. Things have moved on, as you have said in your informative papers, since you last came to see us. Would you like to give us a brief summary of the key changes as you see them?

(*Mr Cruickshank*) Thank you very much, my Lord Chairman. Thank you for this further opportunity not only to make a written submission but to say something. I will be very brief because what I guess this Sub-Committee is about is whether our aspirations are indeed the right things, so a progress report and then over to your good selves. There are seven things I would like to touch on. One is the general one of creating the right regulatory framework for the new communications industry, particularly wideband and broadband applications.

Chairman *contd.*]

We are now moving towards publishing a "White Paper", something short of licence proposals and trying in that paper to limit to the maximum extent the regulation that we are proposing and to focus on solving the competition issues that arise as best we can. Within that framework we are trying to get the right balance between network operators, those who provide the infrastructure, and service providers, those who provide services over that infrastructure. We have recently published proposals on that. That was something that was debated when last we met and, indeed, we have proposed some licence amendments for BT's and others' licences. We have worked to get our position on interface standards both at the network level, where networks are interconnecting, and also the customer level, where the customer is connecting with the network. We are soon to publish our proposals on that. We continue to work on issues surrounding universal service, whether it be the basic service that should be available to everyone or whether it be higher standards which should be available now to schools and the like. We are publishing a statement on that and moving forward with a cross-industry and education community group on that front. We continue to find that the key issues are competition issues, not technological issues. That was perhaps reflected in Mr Taylor's evidence as well. Broadly speaking, technology will deliver what we want. The issue is whether for the consumer there is the spur of competition to deliver what the consumer wants. The problems which we have had in the narrowband world of telecoms doubtless will persist into the broadband world and we are concerned to protect the consumer and to ensure competition, and we have been working a lot on fair trading issues both within telecoms and at the fringes of telecoms in relation to broadcasting. That brings me to the last point I wish to make which is that we have tried in our thinking and policy-making within the jurisdiction which I have, which is telecoms, nevertheless to think that we are evolving into a communications industry rather than a telecommunications industry and that we will need some common rules and some consistency of regulation across telecoms broadcasting, whether it be terrestrial broadcasting or satellite broadcasting, or across the fixed radio systems or whatever. A good deal of our work, even more than when last we met, is concerned with issues arising from what is loosely called "convergence" of what used to be these separate industries. I hope you will see that we are trying to take some real steps to make this marketplace a reality for consumers. The question is whether we are taking the right steps and whether there are different directions that you would like to see us go. Let me stop at that point and give you an opportunity to raise issues with us.

1033. You mentioned convergence and the role of the regulators. It is only fair that I ask you whether you still see separate roles for yourself and ITC or whether the time now approaches when a single regulator might be appropriate?

(*Mr Cruickshank*) The first thing to say is that the DTI, DNH, the ITC and ourselves find that we can work with little difficulty effectively right now. A number of the concerns which I read in the media about that as an issue are, for the moment, not real ones. We can work in a complementary fashion and deal with the issues. Secondly, however, that is clearly under some stress as the technology changes and we move towards a digital world in which the distinction between digital video, telecoms and enhanced services, Internet or whatever, is not there. It is my view that at some point in the next Parliament there will be a need for a Communications Act as distinct from a Telecoms Act or a Broadcasting Bill and the important thing would be for the then Government to properly identify what the relevant market for regulation is, what the right framework of rules should be and only then to go to the issue of what is the right regulatory structure. It seems to me to be the third question to be addressed, not the first question. I would hope to play a role in that debate when it comes, but it is not yet with us. We are coping, I hope, reasonably well.

Lord Gregson

1034. On that basis, you probably know that the cable section of ITC came to give evidence to us this week. In their evidence they suggested, for reasons of the economics of the cable industry, that this may dictate that the last 15 per cent of households cannot viably be served by broadband cable unless that is done through the upgrading of the capabilities of networks that are already in place, ie BT. You probably heard the Minister suggest that that is something that should be discussed with you. Is it within your capability to discuss this, and is it something you are prepared to address?

(*Mr Cruickshank*) Yes and yes. Let me first go to this idea that this world is going to be a mosaic or, to use BT's term, a patchwork of networks; some will be cabled, some will be fixed radio access, some will be satellite, some will be terrestrial and some will be combinations of the two. You will have seen coverage in the press of some possible inter-actions or joint ventures between a satellite broadcaster and BT, the ubiquitous wire which gets everywhere. I do not think we should pick out any one distribution medium and expect to get to 100 per cent of the community. What we are looking for is a set of policies which, one way or the other, through some distribution medium, deliver what we can of this universal service to every home and business in the land. It need not be the cable industry, as we now know it, doing that. I think it is right that the economics of the cable industry will restrict commercially sensible investment to perhaps 85 per cent. Who is going to do the rest? We have direct-to-home satellite already and joint ventures between those and some other telecommunication companies who would deliver. The Government has just licensed fixed radio operators at ten gigahertz who will be able to provide very many of the services that we are now talking about and there is no reason why they should not reach the areas of concern. The question I guess you are coming to is when should BT be in a position to have a scope of business which is determined by its Board rather than by regulation. We are already committed to reviewing the policy on

Lord Gregson *contd.*]

whether BT should be allowed to convey broadcast entertainment to homes, for Government to take a view at the beginning of 1998, which means the work will start in 12 months. That would, if it were to result in any change in the present policy, add another medium of distribution to this last 15 per cent. That issue of universal service and information "have nots" will weigh in my mind as I consider what advice to offer to Government on this issue. My primary concern will be whether a change in the rules promotes competition, but I will have in my mind this issue of "have nots" in the universal service.

1035. The Home Counties may suspect that this is not a mountainous country or a country without hills. In fact, two-thirds of this country has a hill problem, some of which must affect satellite transmission. Quite a lot of this country is restricted from some of the technology that you are suggesting should be spread from this point of view and you finish up with one, which is the twisted-pair. You must take into account the geography as well, must you not?

(*Mr Cruickshank*) Yes. As you can gather from my accent, I live nearer to the hills than perhaps many. Of the technologies and distribution media I describe, some of them are not yet available to you and I as a consumer, particularly the fixed radio access ones.

1036. That is extremely problematic, of course, unless you have a multiplicity of transmission aerials.

(*Mr Cruickshank*) The second issue underlying your question is the other restriction and the scope of business in BT, which is their capacity to use radio tails to get at homes in villages more easily than poles and wires. The Government has made some moves in that direction. The effect of that has been to release much of Scotland and much of Wales but, I understand, precious little of England, if any of England—[1]

(*Mr Walker*) Very little.

(*Mr Cruickshank*) In England the mountainous regions tend to be relatively close to larger centres of population. It is perfectly open to Government to relax these rules in due course. I suspect that Government will want to review the use to which BT and other PTOs put this new freedom and review the situation on a fairly continuing basis because the objective is that we should have a world-class infrastructure over which service providers can compete and that there should, if at all possible, be no "have nots".

Baroness Hogg

1037. Could I just take you back for a moment to the issue of regulation. You emphasise the point that most of the issues you are concerned with are competition issues. We talked about the relationship with the ITC, but, of course, you are, if you like, piggy in the middle of three regulators, OFT on one hand and ITC on the other. I take your point that one should look and decide what the relevant market is before deciding a regime, but there is surely an issue of principle here. Is there in your mind in the future a role for a regulator whose focus is, as the ITC's is at present, on content—content of what, of course, is then to be decided, what range of services—or is the internationalisation of the communications industry going to mean that there is really no point in trying to have a separate domestic content regulator of some kind and that all the regulators can seek to do within the context of international or at least European competition authorities is to promote and protect competition in this country in the convergent industries?

(*Mr Cruickshank*) I think it is highly likely that the government of the day will wish to have an industry specific economic regulator for this new communications industry. I do not think it will wish to rely on general competition law to deal with the particular issues of the communications industry. Point one is I think there will be a need for a new definition of an industry specific economic regulator. Whether that role is shared with standards and content issues is a difficult one. In some countries, ie Canada and the United States, it is shared; in other countries it is not. If the government of the day were to continue with the regulatory model we now have in the UK, which is an individual Director General supported by an office dealing with competition issues, then I think it would be inappropriate to give that person the subjective judgments on content and standards. I think such judgments should only be taken by a commission. If the regulatory model was to change and Director Generals like myself were to be translated into Commissions then you might say, "Well, now we have got another Commission for another reason, why shouldn't this body of people have the capacity to deal with the penumbra of competition and content issues?", because, of course, they are not discrete. We are already finding we spend more and more of our time dealing with international issues. One is in trying to persuade the Commission to do the right thing, as it were, on globalisation, but, in particular, with the FCC in America, beginning the dialogue about how within our respective jurisdictions we are going to promote fair trading in international telecommunications. We are already engaged in that process. I suspect, therefore, that those concerned with content would want to have the same sort of dialogue with their international compatriots. I know that the one bit of content that I am concerned with, which is that which Lady Dean is responsible for, is such that I have a lot of inter-action with European colleagues already because of the international nature of the rather sleazy bits of that business. Yes, we have a national content standards body and oblige it to spend a lot of its time interacting with an understanding of other regimes, but do have it. Whether it is also part of the economic regulation I do not think is so important.

1038. Your mention of the US points me just to ask you one specific regulatory question that arises from

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[1] *Note by the witness*: Radio spectrum at 2 Ghz has been made available by the Department of Trade and Industry to enable operators to provide fixed telephony services by that medium to remote rural areas of the UK. The designated areas are local authority areas where the average population per square kilometre is less than 50. This covers much of Scotland and Wales and a substantial number of local authority areas in England.

Baroness Hogg *contd.*]

the maintenance of restrictions in the telecommunications market and, indeed, the passage of the US Communications Act. Why should AT&T have Condition 13 access to this country when it is not in the business of providing an infrastructure, given the restrictions on the US market were—I do not want to go in too far—at least constructed with some of AT&T's interests in the domestic market in mind?

(*Mr Cruickshank*) Not just AT&T.

1039. No, not just.

(*Mr Cruickshank*) NYNEX, US West, TCI and a lot of them. I think that answers your question in part. Because of the regulatory regime they have been prepared to invest in infrastructure development in the UK, arguably to an extent they have not been yet prepared to do so in the United States because rules have been clearer and the investment climate has been more attractive. One reason for the UK to do it is just to get the infrastructure. There is a technical issue you raised about whether AT&T should get Condition 13 prices. Can I come back to that because there is an issue there which we have addressed in our service provider document? The generality of it is that in 1994 we spent a lot of time convincing the European Government and the FCC that the UK was an equivalent competitive opportunity, it passed the ECO (equivalent competitive opportunities) test as they saw it. That led to some significant advantages for UK consumers and no material disadvantages, which I think is the key. We are still not satisfied that the US market is as open as it might be and the individual companies, notably Cable & Wireless and BT, need to get certain restrictions lifted which they are presently engaged in. Mrs Walker and myself were over in the United States about two weeks ago trying to lay some of the groundwork for successful petitions. It is clear to my mind that the US is prepared to see the UK as a special case within Europe and that it is not unlikely that the aspirations of BT and Cable & Wireless will be delivered, but these international issues tend to get linked to other issues and it is awfully complicated in an election year over there. However, I would expect in due course for there to be no particular restrictions on UK companies investing in the US. The specific issue as to whether AT&T should get what we call Condition 13 prices when it interconnects with BT's or anyone else's network is one we have addressed in the service provider document and our definition of those that would qualify is—I turn to one of my colleagues at this point because we had better get it right.

(*Mrs Walker*) It is companies making a substantial investment in infrastructure networks for the UK, so that is both infrastructure networks within the UK and affecting competition in the UK. That is an important element in relation to AT&T because although AT&T has not been investing in infrastructure here in the UK, it will have infrastructure which, if it is given an international facilities licence by the DTI, will be playing a role in competition networks in the UK telecommunications market as a whole.

1040. We got much the same positive message from our talks with people in Washington last week on the attitude of the US administration to the UK industry, but, like you, I have experience of distance between those expressions and actual change.

(*Mr Cruickshank*) Yes. That is why I was careful in my wording, "expect", "likely", a lot of work to be done both by companies themselves and by us at OFTEL.

Lord Craig of Radley

1041. In your submission you suggest that BT is some way from "a commitment to roll out a broadband infrastructure to the majority of the UK," which is, of course, what cable operators have been doing and we have just seen the cost of ISDN lines in the UK come down apparently quite dramatically. Are we any nearer to a review of that position in the light of this latest BT move, and would you favour any change in the regulatory inhibitions?

(*Mr Cruickshank*) It is interesting to read BT's written evidence to you and to read the oral evidence because what it portrays is that this investment in what Sir Peter Bonfield calls a "mosaic of networks of inter-connection" is actually under way not just within the cable companies but within BT. I would describe BT's network as a patchwork of networks, which was a rather derogatory phrase Dr Rudge used about our policy. The reality is that that is what BT's network is. They are investing heavily in the access network and that is where the issue is. Transmission nationally is not an issue. There is a huge amount of volume there. Interestingly enough, as Dr Rudge admitted, BT is not in a position to make a final commitment to what the best form of architecture is going to be. He observed how things have changed in the last two years, over which time they have been making the case for the broadcasting ban to be released, and he observes that things are likely to change over the next two years. So the industry, including BT, is investing at rates we have not seen before, is exploring different ways of getting the right bandwidth to different classes of consumer—business, small business, high spending, residential, schools, whatever—and I see that process continuing in a very healthy way, almost irrespective of a decision on this so-called "broadcasting ban". I said in response to Lord Gregson that, nevertheless, I intend to conduct a review of whether the ban on BT having a national broadcast conveyance licence is still appropriate and I will be conducting that review next year. The issue as to whether BT can be a provider, ie like Sky and have its own programme content, is something for the Government and the Government has continued to see, I believe, 2001 as being an appropriate time for that to be considered. Can I just crystallise that? My key point is that the investment is going in.

1042. But you appear to suggest that a commitment to roll out a broadband infrastructure was not there. I do not want to get into a play of semantic words, I apologise if I am misunderstanding you, but in paragraph 10, you say: "This is some way from a commitment to roll out a broadband infrastructure to the majority of the UK," and this was your reason for not looking at the regulatory inhibitions which have been placed on BT.

Lord Craig of Radley *contd.*]

(*Mr Cruickshank*) No, my reasons for standing by the policy and the dates at which it will be reviewed are that the policy is working, that a variety of companies are investing in a variety of ways in getting appropriate bandwidth to different classes of consumer. The policy is working and therefore the dates that were set out as long ago as 1991 seem to me to be particularly appropriate. It is only 12 months until we start the review. We are almost there. The point BT makes is that no-one actually knows what the best architecture for a broadband network for everyone in the UK would be. There already exists in large parts of major cities and towns different formulations and within BT different formulations. I think that is the way that you would expect investment to flow and for this new marketplace to evolve. I find it really quite a healthy process.

Lord Haskel

1043. I wonder if I could move the discussion on to the inter-connectivity between this patchwork. Do you consider that the United States is making a more concerted effort to tackle the problems of inter-connectivity? Can we learn any lessons from what they are doing there?

(*Mr Cruickshank*) I find the answer to that question in respect of 1996 is always yes, which is why we go over there a lot and talk to them. There are many levels of inter-connectivity and the like. There are no issues about basic levels of interconnection and so on. It is all at the higher level, both within networks and between networks, where our concerns are at the moment, so we are at about the same point. I may say that the United States is having a real struggle with the new Telecommunications Act to deliver what we have delivered in the UK. One of the most interesting debates we had when we were over there was about how they are struggling to solve in very short order some of the problems we have taken about five years to solve. Can I ask Mr Walker to focus on the higher levels of inter-connectivity and where we are and perhaps an update on the States as well.

(*Mr Walker*) I think in many respects the set of problems that face the United States and face Europe are really rather similar. Indeed, it is a fact that both Europe and North America are operating increasingly within a global market and we are beginning to see far more collaboration between all the regional standards organisations under the general umbrella of the ITU. So I do not think that they have got any magic solution that we do not have because there is already a lot of sharing of thoughts going on. The one trend that one observes in inter-connectivity is it all comes down to a matter of the extent to which you want to see standards both created and then actually deployed in networks. Standards creation in itself is quite a long and difficult process of creating this new intellectual property and standards organisations around the world, be they American or European, all suffer from being a lot slower in terms of creating the standards than perhaps they would like to be. This has led, very helpfully, to the development of a new raft of standards, what one might loosely call standards organisations, so-called consensus groups such as we saw in Europe for digital broadcasting and we now see with the Digital Audio Visual Council, global consensus bodies where it is not really nation states coming together to try and sort out a standard but it is commercial organisations who have a common interest in ensuring that technical problems of inter-operability are solved because that is not going to be the competitive edge that they seek to exploit in the market. So I think in that sense it is very positive that in both America and Europe there is a growing recognition of the value of these bodies and of using them as a fast-track way of getting standards in place. The other side of this coin is how they are going to be deployed in markets. As a regulator one could take a view that every good standard should be obeyed and one should mandate these in some way. This has not been the approach almost throughout the world even within "monopoly" countries that have very little competition. There is very little mandating of telecommunications standards. People will deploy those that make good sense to deploy. We come at this from a competition standpoint. One needs to look at whether the adoption of a minimum set of standards that encourages inter-operability amongst competing operators will lead to an overall gain in welfare across the whole system or whether it will restrict the differential between competing products that customers wish to buy. From our standpoint, we are looking at this very difficult balance of trying to see how far one should encourage the deployment of these things. Uppermost in our mind here is the impact that dominant operators, be they people like BT or other companies, can get in the market through deploying their own standards or just making life that little bit more difficult for those that wish to employ agreed standards. It is these competition areas that we find coming up time and time again. The inter-connectivity problems, like so many other things we have discussed, turn out not to be technical issues but competition issues.

Chairman

1044. Nevertheless, on our visit to North Carolina last week some of us were very interested to see the broadband network that has been installed there actively promoted by the state government but not done by the state government, done by collaboration between various private sector industries, as I understand it, with ATM packet-switching as the standard method, so there is inter-operability and the way in which that is impinging dramatically on uses in education, in commerce and so on, exactly the sort of new services which you were telling us last time we badly need to see introduced in this country.

(*Mr Cruickshank*) But that is not because there is a standards problem in the UK, I do not believe.

(*Mr Walker*) There are already two telecommunications operators in the UK who are supplying a commercial ATM service now and I believe that BT themselves are very close to a public launch of an ATM service. All these companies are buying their equipment from companies, be they European or North American, who have drawn their standards from a consensus group called the ATM

Chairman *contd.*]

Forum set up in America, but it actively has the involvement of people from all the leading OECD countries.

Lord Flowers

1045. It may have been hype, but I had the impression that they were very much further ahead in their network in North Carolina than anything we have heard here.

(*Mr Cruickshank*) That is not because of standards issues, it is because they are Americans, because they can gather together public finance and do things.

1046. There was a sense of leadership and good practice and things of that sort which seem to me to be lacking here.

(*Mr Cruickshank*) I would agree with you, but that is an observation on our society.

1047. And it is not your responsibility, is it?

(*Mr Cruickshank*) No one has touched on schools yet. I would assume that in part it is. I should not just be positioning myself as "I am the economic regulator" if there really are ways in which the telecoms industry and the education community can work together to complement some of the things that some individual companies are doing so that education as a whole, and perhaps other institutions as well, can benefit faster from the deployment of these technologies as you saw in America, so I think I must play that role. As we discussed last time, while there is going to be no way of promoting this investment and the universal service rules as we now see them, nevertheless I think there is some influence we can bring to bear on the various players to do that sort of collaborative effort.

1048. You were talking about education. In this country we have seen the provision of educational technology, we have seen the provision of the equipment, we have seen school girls sitting around TV sets and monitors, some of them enjoying themselves, some rather bored. What we have not seen is any worthwhile content which could be said to be the core of an educational programme. There are lots of frothy additions at the edges but nothing at the real core of the course, so to speak, nor did we see anything like that in the States until we got to North Carolina and then we really did see it working, real stuff being taught. I had the feeling—I do not know whether my colleagues shared it—that this was very much because it was taking part in a set-up where there was a strong focus, a very vigorous lady who was whipping everybody along. She was not ordering it, but she was whipping it along and developing some sense of good practice for everyone to follow. We have not seen this anywhere in this country or anywhere else in the United States, though we did not go to so many places, of course. I just wondered whether you thought a more intelligent focus for content amongst other things would be a good thing.

(*Mr Cruickshank*) I do genuinely believe that this is another example of the United States using, if anything, a poorer infrastructure better to deliver services for various classes of consumer, including those in education. It has nothing to do with regulatory policy, it has nothing to do with standards, it has nothing to do with the deployment of technology. It is all to do with a vision of what the application of these technologies and the content which is becoming available can do in various parts of our social and business life. The most important thing all of us can do, including myself, is to stop arguing about the finer detail of BT's licence or when precisely a ban on national broadcasting might not be lifted and try and invoke some sense of confidence about how this technology can be deployed, how teachers can be equipped to use it, how the Health Service can be equipped to use it better and so on. I would hope that this Committee, if I may say so, would focus on these issues in its recommendations and perhaps give us the benefit of the doubt on some of the technical detail and the regulatory detail because I could not agree more with you. That is why I go to the States every six months, because I want to be refreshed by that vision and by the deployment of an infrastructure which is less good than the one we have but which provides a better level of service.

Baroness Hogg

1049. I did not have the pleasure of seeing the North Carolina work as part of our visit. In Massachusetts, in many ways the home and cradle of a lot of these developments, the roll out for education was almost 99 per cent hype, the wiring up of schools, emphasising the need to develop services and content. Do you think we know enough to start, as it were, putting forward a single blueprint for services and even teaching methods in this area? You appear to be describing it as if it is the general US phenomena and it is patchy, but maybe this is an advantage. Maybe we get a learning experience here. Maybe the Californian work will blow up and not find that it is the right way to teach children, but it will have been a local experiment and Massachusetts at some stage will gain from that. Do we know enough in this country to start holding forth on the kind of services in teaching methods let alone medical services that should be provided?

(*Mr Cruickshank*) I have no idea. I suspect that if I were in your position and someone sat here and said, "Yes I do," I would be very suspicious.

1050. Indeed.

(*Mr Cruickshank*) It is having enough enthusiastic people exploring what the technology can do with committed teachers or doctors that is required. I am not suggesting that there is any blueprint. Our proposal is to work with the industry and schools and not about imposing a blueprint and about being complementary to what is going on and not letting the "have not" schools see whether we can finance them as well. I agree with you. This discussion has now strayed a long way from my strict jurisdiction, but I must say, what Baroness Hogg and Lord Flowers have said seems to me to go to the heart of the issue and is the challenge.

Lord Craig of Radley

1051. You do say that you believe competition in network provision inevitably enhances competition in service provision. Are you prepared to expand a bit on that?

(*Mr Cruickshank*) I would refer you to the evidence you got from Reuters. No doubt there could have been other companies and organisations you might have called to give evidence who would have said the same thing. There has been infrastructure competition which has delivered the dramatic changes that they want to see in telecommunications services so that they can use them and manage them to their business advantage. I point you to real evidence, not just me theorising. Secondly, I go back to the point I made that no one knows what the "right" broadband network would look like so companies competing to find the right structure, the right pattern of investment for various consumer groups is the right pattern and, as I observed with BT, within BT are doing it as well and it is accelerating. Peter talked about BT's ATM launch. Let me assure you, that would not be happening next week or next month were there not two others who had already done it. I am convinced that the infrastructure competition is the right policy and I am reinforced in that view by the recent change in the US legislation which is going down precisely the same route, albeit they still have some problems to solve. What is very interesting is the way some of the established cable companies in the US are now developing their infrastructure so it can compete with the established monopolists, which in turn, having met a few of the established monopolists, is making them sweat. What will they do? They will have to respond to the consumer interest and to the competition. It is beyond the theory, it is working in the UK and I can see it working in the United States. Other countries around the world, including Japan, are going down the same route. I think the question has been answered.

Chairman

1052. I must ask you what you think about the possible impact of European Union policy on your proposals for service provision in schools.

(*Mr Cruickshank*) The Directive on Universal Service will preclude Member States using what is a taxation system in reality, ie taking money from one set of consumers and giving it to another for the purposes of providing advanced services. That is a position that has been taken and supported by the UK Government. If what we are now doing is hoping to act on a voluntary basis with the industry and with the education community to complement what they are doing already—because remember the cable industry are committed to link-ups and BT are doing it unconditionally—then what my role will be to complement that, to put in place *de facto*, I hope, a universal service. There are a lot of schools and libraries which are not on this network because they happen to be in the 15 per cent area which nobody is interested in and so some better working together of the type that Lord Flowers and Baroness Hogg were suggesting is necessary. I am engaged on a crusade, not a regulation.

1053. At that point I am afraid we shall have to conclude. Thank you very much. We look forward to seeing the paper that you are going to send us imminently. If you have anything else you would like to say that you think you should have said and did not say, please write and tell us. Thank you for being so kind as to come a second time.

(*Mr Cruickshank*) Thank you.

Supplementary Memorandum by the Office of Telecommunications

INTRODUCTION

1. This further submission represents a response from the Office of Telecommunications (OFTEL) to the letter from the Clerk to the Sub-Committee dated 16 May 1996. That letter invited OFTEL to provide the Sub-Committee with written evidence on relevant developments in its work since the Director General appeared before the Sub-Committee on 30 January 1996, against the background of the volume of evidence containing those submissions received and hearings held up to the end of March. OFTEL welcomes this opportunity to provide further written evidence to the Sub-Committee on the initiatives it has in hand to promote the development of broadband networks and services, and to explain its objectives and policies to achieve that end, particularly as we note from the Clerk's letter that the Sub-Committee has agreed in principle that the Report arising from its inquiry should address, *inter alia,* the regulatory framework in the UK.

2. We would also like to take the opportunity in this further submission to address some of the points made by BT in its evidence to the Sub-Committee on the nature of the regulatory regime in the UK and the way it impacts on the telecommunications industry.

POLICY FRAMEWORK

3. In the four months since the Director General appeared before the Sub-Committee there has been a good deal of activity within OFTEL on issues relevant to this investigation. This has included progress on a number of initiatives intended, *inter alia,* to promote the development of broadband networks and services:

- further work on the nature of the regulatory regime that will be needed to foster broadband developments (paragraphs 23-27);
- the publication of a Statement setting out the measures we propose to take with respect to service providers (paragraphs 28-32);
- the development of proposals to help educational establishments and public access points obtain affordable access to broadband services (paragraphs 34-36);
- the publication of our price control proposals (paragraphs 37-38); and
- a number of initiatives in the areas of standards and customer interfaces, including those relating to digital broadcasting (paragraphs 39-40).

4. It might, however, be useful to preface an account of this activity and its implications with a brief restatement of OFTEL's overall objective, and the policies being pursued to support that objective, in relation to broadband networks and their use to provide broadband services to customers so that the Sub-Committee is aware of the framework within which the individual activities are set.

5. As part of OFTEL's overall goal of obtaining the best possible deal for the consumer in terms of quality, choice and value for money, it is keen to see the development of both broadband networks and services and is pursuing policies intended to promote investment by those installing such networks or creating such services. And as our initial submission pointed out, we believe that this is best achieved by the promotion of both network competition and competition in services. We also believe that this view is widely accepted across the industry.

6. A further key point made in our initial submission was that due to the high cost of installing public telecommunciation networks, a broadband network was not likely to be constructed as an all-pervasive ubiquitous network all at once. Rather, it would begin either with a limited scope or evolve from other networks. In view of the significant investment by network operators and other service providers in existing networks, an evolutionary approach is often necessary with considerable interworking between new and old networks to maintain ubiquitous access. Thus, the "information superhighway", however it is defined, is likely to be achieved by a process of evolution rather than revolution. OFTEL's policies are deliberately aimed at fostering that evolution.

7. In addition, we believe that the concerns which some have voiced about the creation of "patchwork of local networks" are also unfounded and can be seen as a plea for a monopoly in broadband delivery. Sir Peter Bonfield, BT's new Chief Executive, has publicly said that he believes "the idea of a single fibre-optic network to every home is wrong" and that he envisages the future as a "network of networks with increasing bandwidth across all of them", evolving at different paces in different places using mixed technology, including radio and satellite. We concur with Sir Peter's view; in addition, we believe that competition in network provision inevitably enhances competition in service provision. Interconnected networks already exist in the narrowband world and interoperability between them has not been a problem, with operators adopting either the appropriate global or European standards or the UK specific standards produced by OFTEL's Network Interoperability Consultative Committee. We have no reason to believe that broadband interoperability could not be achieved by a similar process, at least as far as uniform standards are concerned. Such standards will be needed for basic connectivity across networks, though some differentiation may be desirable if innovation is not to be constrained as regards "higher level" service standards.

8. Even since the end of January there have been a number of positive developments towards the creation of broadband networks and services. These include the introduction by Ionica of a fixed-link telephony service by radio, the announcement by the Department of Trade and Industry of the winners of the competition for the use of radio spectrum in the 2GHz and 10GHz ranges (the latter specifically to provide ISDN-type digital services), the continued rapid roll out of their networks by the broadband cable operators and the introduction of a range of new services such as the Internet access services now offered, amongst others, by BT, CableTel and TeleWest. None of these developments individually constitutes a broadband network providing full broadband services. Some, such as the Ionica service and the services to be provided over the 2GHz spectrum are clearly narrowband. Taken together, however, they do reflect the vibrant and progressive nature of the current UK telecommunications environment while some do represent significant steps on the road to a broadband world.

9. OFTEL recognises, however, that there are a wide range of issues—such as those relating to standards and interconnection—that need to be tackled before the objective of a fully broadband world is achieved. Those that fall within the scope of our regulatory responsibilities are currently being addressed and the steps being taken are covered in this submission. We believe the range of initiatives now in hand will go a long way to creating the right regulatory framework in which the development of broadband networks and services can best flourish. In the final analysis, of course, the various market players will need to take their own commercial decisions about investment in infrastructure and in the development of services against the background of the likely returns to be received. The regulator cannot make such decisions happen. It can only put the right regulatory framework in place. We believe we are well on track for doing that.

THE UK REGULATORY REGIME FOR TELECOMMUNICATIONS: POINTS MADE BY BT

10. In both its written submission dated March 1996, and in the oral evidence it gave on 23 April BT made a number of points relating to the nature of the regulatory regime for telecommunications in the UK, its impact on BT in particular and on the development of advanced networks and services in general. OFTEL does not accept the contention in BT's written evidence that "The current regulatory framework in the UK discourages investment in broadband infrastructure by the major telecommunications operators and so constrains the development of the multimedia market". Rather, we believe the converse is the case. BT itself admits that it is "investing heavily in the development of new multimedia services" (Dr Rudge in his reply to question number 501) while the only commitment BT has offered, in the case of the most important of the regulatory inhibitions being removed is "to provide free broadband connections to schools and similar institutions" (page 6 of BT's written evidence), which it could do now and which the cable operators are doing now. This is some way from a commitment to roll out a broadband infrastructure to the majority of the UK, which again is what the cable operators are doing.

11. BT supports its case by reference to four individual aspects of the regulatory regime; the price control regime, restrictions on broadcasting, restrictions on the use of radio tails, and the international nature of telecommunications. The first of these is dealt with below, at paragraphs 37 and 38; the others are covered in the following paragraphs.

Restrictions on broadcasting

12. The restrictions on BT (and other national PTOs and Kingston Communications) from either conveying or providing broadcast entertainment services in their own right have been a long-standing, but temporary, part of the UK regulatory regime for telecommunications. The restriction in BT's licence, preventing if from conveying such services direct to the home, dates from 1984, while in 1991 the Government White Paper "Competition and Choice: Telecommunications Policy for the 1990s" announced that it was not intended to remove it until 2001, although there is scope, from 1998, for the Director General to advise Government that removing the restriction on conveyance would be likely to promote more effective competition in telecommunications. The Director General has already indicated that he would expect to consider the position in 1998 and, in doing so, would wish to consult widely amongst interested parties. On the restriction on providing such services, arguably of greater commercial significance than the restriction on conveyance, the 1991 White Paper said that the Government would review the policy in 2001 only if the Director General advised that a change in policy would be likely to lead to more effective competition in telecommunications.

13. The purpose of the restrictions, which form part of a carefully constructed framework aimed at promoting competition in the access network, is to allow the broadband cable operators a period to establish themselves in which the economies of scope of providing both telecommunication and entertainment services are available to them but not to BT on a national scale. Where cable systems have been installed and are offering telephony, customers are enjoying the benefits of competition in terms of lower prices.

14. BT was, of course, given the opportunity to bid for local broadband cable franchises on equal terms with other potential operators. It had to hold such franchises in a separate subsidiary company but it could have integrated them with its local network to deliver broadband services and telephony. In fact, BT was involved in a number of cable franchises in the early stages but gradually scaled down its investment and is now actively investing in only one, Westminster. It remains open for BT to bid for franchises under the revised arrangements introduced in the Broadcasting Act 1990, and could do so in its own right from April 1994. Thus far it has chosen not to do so.

15. BT has, therefore, been treated, and continues to be treated, in broadly the same way as other potential cable operators in being able to bid for franchises that would give it local exclusive rights for the provision of entertainment services via cable, and in line with the overall policy of giving all such operators the opportunity to build broadband networks in their local areas.

16. Government has consistently indicated—for instance, in both its evidence before and in the response to the House of Commons Trade and Industry Committee Report *"Optical Fibre Networks"*—that it continues to believe that the present restrictions on BT regarding the conveyance and provision of broadcast entertainment services are appropriate. OFTEL shares that view. If the restrictions were to be prematurely removed and BT were to be allowed to provide broadcast entertainment services nationally this would act as a serious deterrent to investment in the cable PTO networks and could mean that an important source of competition was stifled. It is, however, the case that the precise wording of its licence and the relevant statutes allow BT to convey and provide point-to-point services generally and to convey broadcast services to the business community, and to schools, hospitals and libraries.

17. It is OFTEL's judgement that this policy is proving successful, that efficient and sustainable competing main and access networks are being installed, and that the benefits to the customer from competition have begun to be delivered. There is no concrete evidence that the existence of the restrictions is causing BT to reduce its investment in either infrastructure or services, whereas if the restrictions were removed there is no

certainty that its investment would be increased or that it would commit itself to providing a full broadband network for the majority of UK consumers.

18. On the contrary, it is unlikely, whatever the regulatory position might be, that BT would commit to the construction of a single ubiquitous broadband network while the applications that would underpin such investment are still unknown or unproven. BT's own submission demonstrates that it is delivering a wide variety of multimedia applications using a mixture of narrowband, wideband and broadband delivery mechanisms, whichever is appropriate for the individual application. BT's written submission also makes the point that it is now developing a potential "superhighway" based on hybrid fibre/copper technologies, with fibre optic cable being taken to within a few hundred metres of the home. BT notes that such a development—which would mirror the type of hybrid fibre/copper networks being installed by the cable PTOs—was not envisaged as recently as two years ago. OFTEL takes the view that such an evolutionary approach, taking account of gradual developments in both technology and the market, will be the way in which broadband networks and services come into being.

Restrictions on the use of radio tails

19. In its oral evidence to the Sub-Committee BT cited, as an unjustified regulatory constraint, the difficulties it has encountered in obtaining allocation of radio spectrum for "radio tails" for the delivery to consumers of multi-media services. Radio spectrum is a scarce resource and it is not possible to allocate spectrum to all those that seek it. Radio delivery of even telephone services to fixed terminals is a relatively new use and it has had to compete for spectrum with a number of other demands. In addition, the use of radio technology offers an important and potentially economic route by which new operators can enter the market for local delivery services in competition with BT. If BT were given unrestricted access to the limited radio spectrum available for such services this would greatly increase its potential for undermining successful new market entry. This does not mean it should have no share of the spectrum that is available, but does mean that its spectrum requests in this area do need to be scrutinised with care.

20. In fact, BT, along with a new company, Radiotel, has recently been awarded spectrum at 2GHz for the delivery of local telephony services by radio in less densely populated areas, including some in England, as well as in Wales and Scotland. Other companies, such as Ionica, have launched or have plans to launch such services more widely in the UK. BT was unsuccessful in a parallel DTI competition for three licences to offer digital wide-band telephony services using radio at 10GHz without geographical restriction (the successful applicants were NTL, Ionica and Mercury Communications). The Government is currently considering its policy on awarding licences to use DECT and CT2 technology for public services, following the new EU Directive on Mobile Telephony services.

International aspects of regulation

21. Also in its oral evidence before the Sub-Committee BT made a valid point about the need to strike a regulatory balance between promoting competition at the national level and ensuring that UK companies can compete internationally. OFTEL agrees that there is a balance to be achieved and believes that it has achieved it in the approach it has adopted. By pursuing policies aimed at promoting competition at all levels in the UK telecommunications market, OFTEL believes that it is contributing to improving the competitiveness of UK firms. As the Secretary of State for Trade and Industry recently made clear, it is not the place of competition policy to create so-called national champions. The best prospect of a company becoming a successful global competitor is the experience of a demanding competitive market at home. Allowing companies the luxury of protection from competition at home does not improve their position in the long run.

22. The other important aspect of OFTEL policy on international matters has been the initiatives taken to open up overseas markets to UK telecommunications operators that have thus far been closed. This has taken the form of bilateral contacts with regulators overseas, with the European Commission and particularly in involvement in negotiating the detailed directives through which liberalisation in the EU will become a reality. We have, for instance, developed working relationships with the FCC as the US moves to a market structure more like the UK and begun to contribute to the debate on global competition issues with submissions to the FCC and, with the OFT, to the European Commission on the Atlas case (the proposed joint venture between France Telecom and Deutsche Telekom to provide managed data network services and has been referred to Article 85 clearance).

RECENT RELEVANT DEVELOPMENTS IN OFTEL'S WORK:

Regulation of broadband networks and services

23. OFTEL's initial written submission to the Sub-Committee referred to the publication in August 1995 of a Consultative Document *"Beyond the Telephone, the Television and the PC"*, which considered the regulation of the telecommunication networks that will carry advanced information services, and copies of the Document itself were forwarded to the Sub-Committee. Since the beginning of the year we have been actively considering the responses to the Document and the further steps that we should now take.

24. The Document attracted over 70 comments, from a wide range of respondents: network operators (including the terrestrial broadcasters), equipment manufacturers, trade and industry associations, consumer groups (including the telecommunications advisory committees) and consultants. The size and quality of the responses varied greatly, some being only a page or so, concentrating on issues of particular concern, though most were substantial documents to which a good deal of thought and time had been devoted. With only one or two exceptions, those that responded were content for their comments to be put in to the public domain.

25. In so far as general inferences could be drawn from a large number of comments, many of which were mutually contradictory, the key messages to emerge from the responses which may be of interest to the Sub-Committee, were as follows:

- there was a widespread and general welcome for OFTEL's initiative in publishing the Consultative Document;
- there was a consensus that broadcasting, ie rather than switched systems, would continue to have a significant market presence well into the future, while broadband switched systems would develop at a lower rate than the Consultative Document anticipated;
- there was widespread support for a fundamental review of the regulatory regimes covering communications;
- the importance of the international nature of the market was emphasised;
- also stressed was the importance of the public sector as an early adopter of new services;
- there was considerable support for the principle of open access to broadband networks for service providers, though differing views on when and how that should be required as a matter of regulation;
- although the Document concentrated on broadband networks and how market power might be generated by network operators, many commentators felt that the real market power will lie in the control of content and services rather than in networks;
- ISDN pricing and availability emerged as a real issue;
- there was a widespread concern amonst consumer groups that OFTEL should have a greater role in consumer protection than was envisaged in the Document; and
- there was general support for the proposed regulatory framework for dominant network operators, but differing views on its detail and how it should be imposed.

26. We have prepared a summary of the responses to the Consultative Document, which can be made available to the Sub-Committee should it wish to see it.

27. We now intend to produce a further document that will review both the comments we have received as part of the consultation exercise and the developments in the market and the regulatory scene since August last year, deal with what now appear to be the key issues (including those that are likely to arise in the short term) and propose the courses of action that we intend to follow. This document should be issued later this year.

Service providers

28. As the Sub-Committee will know, on 5 February OFTEL published a Consultative Document entitled *"Promoting competition in services over telecommunication networks"*. The document reflected OFTEL's concern to ensure that the right regulatory framework exists for those who wish to provide services over others' networks rather than build networks themselves ("independent service providers"). The two main proposals were, firstly, to give BT greater freedom to offer lower prices to independent service providers (ISPs) than to retail customers for the use of its network in recognition of the essentially wholesale nature of the service that ISPs purchase, and, secondly, to establish a clearer distinction between BT's activities as a network operator (the provision of "network services") and its activities as a provider of value-added or "enhanced" services such as electronic mail, Internet access, and on-line databases.

29. Over 40 responses to the document were received. On the issue of prices for access to BT's network, there was general, albeit not universal, support for the proposal that ISPs should obtain such access at prices less than the full retail rate paid by other retail customers. Respondents divided broadly into those (mainly

network operators) that saw a case for allowing discounts based on cost savings but no more, and those that argued for the lower "interconnect" prices available to network operators. However there was considerable concern that BT could use any additional pricing freedom it was given anti-competitively to the detriment of other network operators and ISPs. There was widespread support for the principle of the distinction between BT's activities in the supply of "network services" and "enhanced services", tempered by concern that the proposals could be difficult to achieve in practice given the complex and developing technologies involved. A number of representations were made on the relocation of specific services within the two categories because of concern that it could affect the existing structure of competition in the market for those services.

30. On 6th June OFTEL published a Statement setting out the measures it intends to adopt in this area in the light of the responses to the Consultative Document, and at the same time set in hand the necessary statutory consultation on proposed modifications to BT's licence to implement them. Copies of the statement are enclosed with this submission. The Statement broadly confirms the proposals in the February Consultative Document:

— BT will be allowed, and indeed will be expected, to offer prices for network services to ISPs below retail prices charged to end users, to reflect any lower costs incurred in serving ISPs. OFTEL would not, in principle, consider that this represents undue discrimination under Condition 17 of BT's licence (which prohibits undue preference and discrimination). A definition of ISPs will be drawn up, and may be incorporated in a new class licence under discussion with DTI. Greater pricing freedom for BT with respect to ISPs is contingent on having the Fair Trading Condition in its licence;

— entitlement to "interconnect" prices from BT will in future be confined to network operators and International Simple Resale licensees (until competition in the international calls market is established). Guidance on who would be considered a network operator will be drawn up in consultation with DTI; and

— new definitions of those parts of BT's businesses providing network services (known as the "Systems Business"), and enhanced services (known as the Supplemental Services Business), will be incorporated in the licence. The significance of these terms is that they affect the price that BT must "charge" itself (in accounting terms) for the inputs to services—a service in the Systems Business pays interconnect prices, a service in the Supplemental Services Business pays (higher) retail prices. In the main the new definitions will reflect the distinction between "network services" and "enhanced services", although there will be provision for the Director General to agree with BT, subject to third party consultation, that an enhanced service should be provided for the Systems Business where the "enhanced" element is small and it would be more efficient for the service to be provided by network operators than by ISPs. As a general rule though, enhanced services are readily capable of being carried out by ISPs.

31. The statement also seeks views on the needs of ISPs in respect of the allocation of numbering capacity and access to interconnect interfaces. A new class licence giving ISPs an entitlement to numbers and appropriate interfaces, and which could also serve to identify those eligible for lower prices from BT, is being considered with DTI.

32. OFTEL believes that the measures set out in the statement will facilitate the transition to a fully competitive UK telecommunications market which includes both network operators and independent service providers, providing consumers with a range of innovative, quality services at affordable prices.

Universal Service

33. OFTEL has now completed its latest round of public consultation on universal service, and is developing proposals with the intention of publishing details of the new universal service regime, including draft licence modifications, in November this year. Following this consultation process it has concluded that for the present, the level of universal service should be "affordable access to voice telephony via a digital exchange line". However, it has been accepted that this level of service will need to be kept under review as technology develops and the penetration of advanced services increases. OFTEL will therefore closely monitor and review the level of service.

Education and Public Access Points

34. OFTEL will be publishing a statement later this month setting out how it plans to take forward work on assisting educational establishments and public access points to obtain affordable access to broadband services. Copies of this statement will be made available to the Sub-Committee immediately it is published. In OFTEL's December Consultation document *Universal Telecommunication Services* it was suggested that the universal service analogy might be an appropriate mechanism for delivering affordable broadband services to schools. The overwhelming majority of those consulted supported the concept of assisting educational and other public institutions to gain access to such services at affordable rates, and endorsed

OFTEL's role in stimulating public debate on this. But there were differences of opinion as to whether or not schools should be the focus of attention and a lack of consensus on whether that the universal service approach was an appropriate mechanism for funding this desirable policy.

35. Following this consultation process OFTEL has concluded that it has been given widespread encouragement to take action and that educational establishments and public access points, not just schools, should be the top priorities for action. OFTEL has decided to pursue this separately from its work on universal service for the following reasons:

— all telecommunications operators were opposed to using formal universal service as a mechanism for subsidising a different level of service for educational establishments and public access points. They argued that instead the industry should be given the opportunity to meet the requirements commercially;

— the present definition of universal service is very restricted in terms of meeting the wide-ranging needs of educational establishments and public access points and in terms of what parts of the industry are involved in funding it. Educational establishments and public access points have a variety of non-telecommunciations needs including training, internal networks, computer hardware, software, technical support and useful applications. However, universal service could only be used for a narrow range of services defined within the Telecommunciations Act and funded by Telecommunications Act licensees;

— there is scope to work with the existing educational and local authority structures to develop an understanding of the needs of education establishments and public access points and also avoid any administrative duplication; and

— developments in Europe aimed at opening up European markets to the benefit of UK industry currently restrict the possiblity of defining a higher level of universal service.

36. Instead OFTEL will challenge network operators to demonstrate that regulation in these market segments is unnecessary by developing a collaborative approach which:

— offers affordable connection to wideband or broadband networks to all educational establishments and public access points within their licensed area, building on and expanding pilot projects already underway;

— develops predictable and affordable usage tariffs which reflect the constraints on educational institutions' and local authorities' budgets; and

— establishes industry wide partnerships to deliver the telecommunications needs in a coordinated way.

To assist with this the Director General is setting up and chairing a Task Force with industry, education, local authority and consumer representatives.

Price control review

37. In its oral evidence to the Sub-Committee, BT made the point that one effect of the current price control review might be to jeopardise the profits that would fund investment in the development of broadband networks and services. As the Sub-Committee will know, OFTEL has now published its proposals for the control of BT's retail prices for the period 1997–2001. In summary, we are proposing to move away from the present control covering nearly all retail services and markets to a retail price control to focus protection on the first 80 per cent of residential and small business customers. These customers do not have the same benefit of competition enjoyed by large business and high value residential customers. There will be no formal price controls on services to medium-sized and large businesses. Copies of the Statement, issued on 3 June 1996, have been made available to its Members.

38. In developing these proposals OFTEL has seriously considered the possible effect that they may have on the future development of broadband networks and the services that will use them. We believe, taking an informed judgement on the pace of development of competition in telecommunications markets, that the proposals will not have the impact BT feared (perhaps at a stage when it thought OFTEL would extend the present retail price controls covering virtually all services and markets to 2001) for the following reasons:

(a) this should be the last retail control of BT's prices. All retail markets should be competitive by 2001 when the disciplines of the market place will take over:

(b) over the period of the new price control (1997–2001) the restriction of the proposed retail cap to the residential and small business markets will mean that only 26 per cent of BT Group Revenues will be price capped as against 64 per cent now. BT will thus have the freedom to take a commercial judgement on the prices for the services from which it derives the majority of its revenues, taking into account the state of competition and an assessment of the future services and facilities needed by these markets;

(c) the proposed new retail price controls deliberately do not apply to new services, such as broadband services. We would expect such services to generate a return determined by the market and would only consider controlling prices if it was demonstrated that BT was abusing its market power in a new service;

(d) in setting the proposed level of retail price control OFTEL has *not* taken into account investment needed to provide new broadband networks. Such investment has been excluded from the calculation of costs which BT can be expected to recover through prices charged for the services covered by the price cap. It is OFTEL's view that this investment in new networks and new services should be recouped from revenues from such networks and services. Customers using price-capped services should not be expected to pay higher prices to fund this investment. BT would be able to raise funds in the normal way to finance such investments, regardless of its profits on other services, if such investment was sound; and

(e) consistent with this approach OFTEL does not believe it is right, during the period of the proposed new retail price control proposals, to expect the future users of broadband services and networks to be cross subsidised by the first 80 per cent of residential customers.

Standards and Customer Interfaces

39. Since the publication of the Consultative Document "*The Customer Interface to Public Networks*" in July 1995 we have been considering the policies that should apply in this area. These divide into issues of *scope* and issues of *process.*

40. *Scope:* the question here is the extent to which regulation should apply to customer interfaces. If too much is regulated, then competition through differentiation of market products would be restricted; if too little, then the reasonable expectations of customers and independent service providers of interoperability across networks will not be met and standards could be dictated by those operators with significant market power. We have recognised the importance of linking the developing thinking here with that on policy on interconnection between network operators and intend to publish a further consultative document in August which will contain proposals for both areas of interoperability.

41. Our conclusion on the *services* for which interfaces should be subject to some regulatory oversight is that this should comprise the same set of services as is being considered as "basic network services" in our parallel work on service providers (see paragraphs 28–32 above). These are basic services which can either only be provided by licensed network operators or are more efficiently provided by them. To the extent therefore that such network operators have a privileged market position (if not market power) in the provision of basic services, then they should be required to observe some controls designed to ensure interoperability.

42. In contrast, it would be inappropriate to regulate enhanced services in a similar way, since in many cases it will be independent service providers creating innovation in this area and it would be inappropriate to regulate network operators in areas where the market comprises both sets of players. However, any developments which distort or impede competition could still be addressed by the proposed Fair Trading licence condition. The distinction is thus proposed that "ex-ante" regulation should only apply to basic services and then only to the extent necessary to secure an appropriate level of interoperability.

43. *Process:* the question here is how to encourage the emergence of new basic service interfaces, especially in cases where such innovation arises before the development of international, European or UK standards. Since basic services will need to interoperate with other networks, the operator first introducing such a service could, by setting standards convenient to itself, have the effect of raising the costs of other operators and inhibiting desirable interoperability. Not only would this affect competition between network operators, but it could also have the effect of inhibiting the market for enhanced services, which depend on the existence of basic services across such competing networks.

44. We shall thus be proposing that when an operator wishes to introduce a new basic service which requires new standards, it should agree both customer and interconnect interface standards with other operators and other relevant parties through the vehicle of the Network Interoperability Consultative Committee. It should do so early enough that manufacturers can deliver both network and customer equipment in time for the proposed launch. It has been argued that this amounts to a requirement to announce new services in advance to the market. We recognise the risks in this area. It is certainly not our intention that companies should share their innovative ideas with the market, only that the necessary basic standards should be agreed by consensus beforehand. There is no plan to ask companies to share wider information about new services. We propose that such requirements should apply to all operators while increasingly new basic services are already the subject of European standards. By migrating the UK interconnect signalling to European standards (currently being addressed by the operators) the need for UK-specific interconnect standards will be reduced. When a new customer interface is adopted, operators will be required to publish the fact through an appropriate system of declarations; this requirement forms part of several current EU Directives which will come into force in 1998.

45. In the event that consensus on a new customer interface fails to be achieved, we propose that where this can be shown to be against the interests of customers, the Director General should have the power to impose a standard. This would mirror the existing powers the Director General has with respect to interconnect interfaces. As well as applying an appropriate moderating influence on the market, we would be concerned if any imposed standard had a significant impact on the costs of the affected operators. We would thus ensure that such standards debates are held, wherever possible, ahead of any operator or manufacturer having committed substantial resource to any given version of the interface.

46. To the extent, however, that new broadband services will be enhanced services, no restraints will be imposed on them, except for the underlying broadband conveyance services. In this area, we note that standards are emerging, driven both by the formal standards setting process through the European Telecommunication Standards Institute (ETSI) and consensus group such as the ATM Forum and DAVIC (the Digital Audio-Visual Council).

Broadcasting interface issues

47. Current Government proposals envisage OFTEL regulating certain aspects of the new market in digital television. In principle we will apply similar regulation to network and customer interfaces to this market, although precise proposals will need to await the outcome of the multiplex licensing round. Meanwhile, we note that a consensus group, called the Digital TV Group has emerged, which is building on the work of the European DVB consensus group, to ensure the successful launch of digital terrestrial television in the UK.

48. We note that in both this area and the related satellite television market, there is a growing recognition by the industry that consumers do not want multiple set top boxes in their homes. Additionally, the emergence of competing designs would not be consistent with creating a large enough market to generate the scale economies needed to deliver such boxes at prices which consumers can afford. This has led to a wide degree of mutual understanding on the need for set top boxes to be designed around a common core of technology, which can be adapted to the medium of delivery (terrestrial, satellite etc) and the chosen method of conditional access. With such consensus emerging voluntarily, there is less reason for OFTEL to intervene in such matters, though we intend to monitor and facilitate in this area, for example by bringing the cable industry more fully into the discussions. We also intend to monitor proposals for subsidising set top boxes as this might have anti-competitive effects and, as with the mobile market, have long term impacts of the industry structure.

49. The need for "interconnect" interfaces within the broadcasting market will depend on the extent to which the market develops with a mixture of both vertical integrated players and those performing more limited roles. We will be ensuring that interface standards are not used to limit or restrict fair competition in this market.

The development of digital television

50. Following the White Paper on Digital Terrestrial Television published by the Government in July last year and the more recent (January 1996) proposals for the regulation of conditional access services for digital television (ie including satellite and cable as well as terrestrial delivery mechanisms) OFTEL has been involved in the work towards the development of digital television—which can be regarded as one of the transitional technologies on the road to full broadband service—on a number of fronts:

(i) consulting with DTI and DNH on the relevant provisions of the Broadcasting Bill now before Parliament;

(ii) considering with DTI the form and content of the licences to be granted to multiplexers and conditional access providers (the proposals published in January see OFTEL as having responsibility for the regulation of these services through Telecommunications Act licences); and

(iii) again with DTI, considering the steps necessary to implement the European Union directive on advanced television standards.

Office of Fair Trading review of the pay-TV market

51. Towards the end of February OFTEL made a submission to the Office of Fair Trading's review of the pay-TV market. This set out a number of issues where developments in the pay-TV market may have a major bearing on the prospects for competition in the access network and the Government's policy of promoting competing telecommunications infrastructure, including broadband infrastructure. This submission was published and is available to the Sub-Committee should Members wish to see it.

OTHER DEVELOPMENTS

52. Although not directly relevant to the Sub-Committee's investigation, it may be interested to learn of two further areas of OFTEL's work:

a. last month we published the *OFTEL Management Plan* for 1996–97, which sets out clearly what we are planning to do, why we are doing it, when things will be happening and who in OFTEL is responsible for a particular area of work. In particular, it describes all of the major projects underway in OFTEL—some of which have been referred to in this submission—and explains how they form part of the task of achieving our overall objectives. Copies of the Plan (and a shorter Agenda which provides a summary of the key areas of work and their timescales) are available to the Sub-Committee if it should wish to see them; and

b. OFTEL is deeply involved alongside DTI, which leads in the negotiations in Brussels, on the package of EU legislation aimed at the liberalisation of EU telecommunications markets by January 1998. Key legislation currently under discussion includes the Licensing Directive, which seeks to establish common rules and a common framework for licensing policy across Member States in order to facilitate market entry, and the ONP Amendment Directive, which seeks to update the ONP (Open Network Provision) framework rules concerning access to networks and related issues such as standards to fit a multi-operator environment and leased lines. OFTEL has also been closely involved in the negotiations on the Interconnection Directive which aims to establish a common framework of principles for interconnection between network operators. Looking ahead, the Commission is preparing proposals on Voice Telephony, Universal Service and Numbering, to which OFTEL is contributing from its own experience of these issues in the UK. OFTEL's unique expertise as the first European independent telecommunications regulator is being deployed in these debates.

Office of Telecommunications
June 1996

TUESDAY 25 JUNE 1996

Members present:

Butterworth, L.	Haskel, L.
Craig of Radley, L.	Hogg, B.
Flowers, L.	Hollick, L.
Gregson, L.	Phillips of Ellesmere, L. (Chairman)

Memorandum by the Rt Hon Viscount Cranborne DL, Lord Privy Seal and Leader of the House of Lords

Question 3 How does the UK Government match up to that of the US in achieving each of the nine principles identified in the US National Information Infrastructure Task Force's Agenda for Action.

PRINCIPLE 1: PROMOTING PRIVATE SECTOR INVESTMENT

Reply

Major investments are being made in the UK communications infrastructure already. BT spent £2.8 billion last year on capital expenditure, the rest of the industry is spending similar sums, cable companies are expected to have invested some £12 billion by 2000. These investments are driven by the market.

PRINCIPLE 2: EXTENDING THE "UNIVERSAL SERVICE" CONCEPT TO ENSURE THAT INFORMATION RESOURCES ARE AVAILABLE TO ALL AT AFFORDABLE PRICES

Reply

The Office of Telecommunications (Oftel) has conducted a recent consultation on the coverage of the Universal Service Obligation and how it should be delivered. The results showed wide agreement on the importance of retaining universal service for a basic telecommunication service. At present this is defined as voice telephony with some features which a digital switch makes available. However, Oftel recognise the need to keep this definition under review as the range of services commonly available to the majority of the population expands.

PRINCIPLE 3: PROMOTING TECHNOLOGICAL INNOVATION AND NEW APPLICATIONS

Reply

DTI contributes funding (indirectly in the case of the European Union programmes) to a range of research, development and demonstration programmes tackling technological innovation in key fields related to the Information Superhighway. The £35m budget of the DTI's Information Systems Initiative also includes some provision towards technological innovation and new applications.

PRINCIPLE 4: PROMOTING SEAMLESS, INTERACTIVE, USER-DRIVEN OPERATION

Reply

This was recognised in the report of the Standards and Interoperability sub-group (led by Peter Job, Chief Exec of Reuters) of Mr Taylor's Multimedia Industry Advisory Group which said that:

- *"Standards are best fixed by industry players on a voluntary basis within international bodies that exist for that purpose....In a fast-changing environment, standard-setting by Government does not usually provide a satisfactory answer."*

However the main interoperability standards are written by ETSI and ITU. About a year ago, ETSI recognised the need to speed up and focus their efforts and DTI were glad to respond to the request of UK industry and make available a senior DTI official (Stephen Temple) to chair the High Level Task Force that looked at re-engineering ETSI. His report was adopted by ETSI in June 1995 and an implementation group, of which a DTI official is vice chairman, is preparing the detailed constitutional and procedural changes which will be put into effect progressively later this year.

PRINCIPLE 5: ENSURING INFORMATION SECURITY AND NETWORK RELIABILITY

Reply

Government, through DTI, has a major involvement in security issues. For example:

- DTI has a dedicated unit working on information security issues, which is active in advising industry on relevant and topical issues.
- The Department has recently published a booklet on Internet Security (especially aimed at SMEs) as part of the ISI Initiative.
- DTI were instrumental in introducing BS 7799 (the Standard on Information Security Management) which gives IT users guidance on best practice in countering security threats (such as hacking).
- On *encryption*: HMG's recent Parliamentary announcement (10 June) proposing the licensing of Trusted Third Parties (TTPs) providing encryption services for business. [Announcement was included in written submission to Committee.]
- This policy has been drawn up after substantive discussions between Government Departments. Aim is to provide secure communications for industry and commerce (an essential ingredient of the information society) whilst safeguarding law enforcement requirements through warranted interception.

PRINCIPLE 6: IMPROVING MANAGEMENT OF THE RADIO SPECTRUM

Reply

The Radiocommunications Agency (an executive agency of the DTI) is responsible for managing most of the non-military spectrum and for representing the UK in international discussions on radio. On 17 June the Agency issued a Command Paper "Spectrum Management in the 21st Century" (Cm 3252).

PRINCIPLE 7: PROTECTING INTELLECTUAL PROPERTY RIGHTS

Reply

Copyright and rights of performers are the intellectual property rights in UK law that are likely to be most affected by the advent of the information society.

UK copyright law was revised and updated relatively recently (the Copyright, Designs and Patents Act 1988) and is well placed to meet the challenges of the digital age, subject to fine tuning as necessary. This message was part of the UK's response to the European Commission's recent *"Green Paper on Copyright and Related Rights in the Information Society."*

In particular, UK copyright law already protects works in electronic environments, for example, the storage and transmission of literary works in on-line systems.

UK has told the Commission what standards of copyright protection appear necessary in the digital age and will continue to play an active role in discussions at Community level.

Most importantly, the information society will require *international* harmonisation of copyright laws to an appropriate standard. To this end, the UK will continue to support and contribute to the ongoing work in the World Intellectual Property Organisation (WIPO) on possible new multilateral treaties. A diplomatic conference has been arranged for December 1996.

PRINCIPLE 8: COORDINATING WITH OTHER LEVELS OF GOVERNMENT AND WITH OTHER NATIONS

Reply

Government has a wide range of machinery for co-ordination both within Government and internationally.

Already mentioned in response to Question 2 the range of national bodies. Chief among them for co-ordination within Government is the Ministerial Group on IT. There are of course in addition many contacts between different parts of Government on a less formal basis.

The Government is fully involved in a range of international bodies dealing with matters relating to the information society, for example:

- within the EU which has a large number of bodies covering a wide range of topics relating to the information society

- — the G7 countries which have set up a number of collaborative information society pilot projects in which the UK participates
- — other bodies like the OECD, the International Telecommunications Union, the World Trade Organisation, various technical bodies

There are also many bilateral contacts between Governments.

It is in the UK's interests to keep abreast of developments in other countries, to ensure that we can learn from best practice elsewhere and avoid others' pitfalls.

PRINCIPLE 9: PROVIDING ACCESS TO GOVERNMENT INFORMATION AND IMPROVING GOVERNMENT PROCUREMENT

Reply

This question encompasses two separate issues.

Improvements to access to Government information and Government procurement are both among the tasks being addressed by the Central IT Unit. Subject to discussion by Ministers, I anticipate that their proposals on this and other topics will be published in due course.

BACKGROUND

PRINCIPLE 3

UK has a good track record of fostering innovation in the fields relating to the information superhighway with an active academic and industrial research community. UK organisations are very active in international research programmes and international standardisation bodies.

Companies themselves are investing massive sums in technological innovation in information and communications technologies such that the public money available is small in comparison. DTI's approach therefore is to stimulate collaborations between companies, involving academe when appropriate, in strategically important fields.

Examples of programmes to which DTI contributes:

LINK: a Whitehall-wide scheme designed to foster collaboration between academia and industry. Support from DTI includes the following programmes:

Personal Communications – next generation mobile personal communications products and services;

Photonics and Optoelectronic Systems – research into the devices needed to operate optical fibre networks;

High Performance Interfaces and Protocols – work which allows interworking of varied networks.

DTI is also supporting the following programmes which fall under other funding schemes:

Computer Supported Co-operative Working – addresses issues related to co-operative working over networks e.g. teleworking;

Virtual Centres of Excellence in Mobile Communications and Digital Multimedia – both centres bring together the best UK academics in their fields to provide an integrated research and development facility;

Multimedia Demonstrator Programme – part of the Information Society Initiative, this programme fosters novel applications of existing information and communications technologies.

DTI is also fostering UK activity in collaborative European research activities as follows:

EUREKA—an industry directed research scheme in which UK companies are involved in key projects relating to broadcasting and microelectronics.

FRAMEWORK IV—Europe's strategic research programme where UK players are very active in the information and communications programmes, namely ESPRIT (IT components and systems), ACTS (advanced communications) and Telematics Applications (validation and demonstration projects of user-led applications using information and communications systems).

TRANS-EUROPEAN NETWORKS TELECOM—a non-Framework European programme arising from the Bangemann report aiming to facilitate implementation of pre-commercial applications in much the same areas as the Telematics applications programme within the Framework Programme.

INFO2000—another non-Framework Programme to stimulate the development of European multimedia information content industry.

COST—a co-operative forum addressing fundamental research issues, covering diverse topics such as communications for the disabled, health aspects of radio communications and satellite communications.

PRINCIPLE 4

Standardisation for Information Superhighways is carried out in different ways at different points of the value chain.

Network standards

At the most basic level of the value chain are standards for network interoperability. Here the problem is to make sure that a large number of geographically dispersed networks operated by entities that are increasingly in competition with each other can be interconnected to form a seamless web. This involves not only the physical interconnection of circuits but also the interworking of network intelligence between networks and agreement on addressing, so that messages are correctly routed from the originator to the recipient. Of equal importance is that, where a number of network operators are involved in a delivering service from one point to another, a way has to be found to bill the user and allocate an appropriate share of the income to each operator.

Standardisation at the network level is carried out within organisations fitting a traditional model. At the international level the main body is the International Telecommunications Union (a United Nations agency). At the European level, the European Telecommunications Standards Institute (ETSI) carries out the work. ETSI is mandated by the European Union to carry out telecommunications standardisation for Europe, and most companies interested in telecommunications in Europe are members. In 1995, some 75 companies out of a membership of around 340 were from the UK and this included many SMEs.

On the whole, this standardisation process works well, although it can be rather slow. It is very helpful to the process that the standardisation programme and the standards themselves are determined by companies and organisations with an economic interest in usung them. The Department's officials play an active role at the top management level within ETSI to ensure that the Institute carries out its work to the benefit of UK-based companies and that it is sufficiently responsive to the need for change.

Service standards

Above the basic network level standards needed to make use of the networks. Here the problem is to agree an architecture that will allow entrepreneurs to exploit the basic network infrastructure. At present this is developing in the manner of a client/server model whereby users (the clients) demand services and information from computers and databases (the servers) across the networks. Internet works in this way and a similar approach has been adopted by the Digital Audio Visual Council (DAVIC) who have proposed a client/server architecture capable of supporting high speed digital multimedia applications of all sorts.

DAVIC is a voluntary international association which has been highly influential in its work. It consists of many multimedia and telecommunications companies operating outside the traditional standardisation framework. Such an approach brings the advantages of speed, focusing effort towards meeting market demands. There are some problems though, including the question of how, in the future, to maintain and develop standards that may still be used extensively, but are no longer at the cutting edge of the technology and so may not attract resources.

Application standards

At a higher level of the value chain still, there may be a need to develop some standardisation of approaches to the way that applications exploit the client/server model and how users access content lodged in the servers. There is a careful balance to be struck, however, between encouraging investment and early standardisation.

In the case of European digital television, the standardisation needed to ensure this balance was agreed by the members of the Digital Video Broadcasting Project and subsequently formalised by ETSI. This two-stage process was able to meet both rapidly-changing market conditions (in the DVB) and the need for formality (in ETSI) to underpin an important part of the investment case for digital television. The Department has been active in these forums and in encouraging UK players in the commercial sector to take part.

At the top of the value chain are the software applications that allow consumers to make benefit from the services and content on offer. Some key markets are currently led by a few dominant players. Microsoft has become almost synonymous with the personal computer, but the rapidly changing state of the market in superhighway applications has led to their position being challenged by new players such as Netscape, who have designed the most widely-used World Wide Web browser.

The need for rapid product development and product differentiation mean that this market is likely to be determined by proprietary, de facto standards for the foreseeable future. The interface between software and hardware and between two pieces of software must be open and available to all players. This may be achieved by appropriate standardisation of what is known as the Application Programming Interface.

PRINCIPLE 5

Other UK involvement on security issues:

> DTI and CESG jointly manage the UK IT Security Evaluation Scheme which evaluates and certifies IT security products. (This is similar to US security evaluation but differs in the sense that the UK Scheme is run on a commercial basis and evaluation is undertaken by commercial organisations whereas in the US, evaluations are undertaken by Government organisations.)
>
> The UK along with Germany, France and the Netherlands wrote the IT Security Evaluation Criteria (ITSEC) which was adopted across the EU by Council Recommendation 95/144/EC on 7 April 1995. These four authoring nations have since worked with the US and Canadian Governments to merge the EU, US and Canadian criteria into a Common Criteria for the evaluation of security products. The first public version of the Common Criteria was released in January 1996.
>
> DTI lead at the European Commission's Senior Officials Group for Information Security (SOG-IS). This group has been instrumental in assisting the Commission in developing a new draft Information Security R&D Programme in the form of a new Infosec Decision. It is hoped that the Commission will adopt the decision later this year.

Encryption technology is seen as the most important in terms of information security. Encryption can offer confidentiality and integrity services, which will allow greater use of electronic commerce. Confidentiality services will protect electronic information from being accessed or read by unauthorised persons. Integrity services will confirm that information was sent when claimed, and by whom, it will also confirm the information has been unaltered.

Unfortunately encryption used for confidentiality can seriously affect the ability of law enforcement agencies to intercept communications, thus a balance has to be struck between the needs of business and the requirements of law enforcement. By holding the encryption keys Trusted Third Parties can provide encryption to their clients and provide the keys to the law enforcement agencies under due legal process.

The announcement on 10 June—via a written PQ—has (so far) been greeted by silence. No mention in national press and only limited interest in technical journals. There has, however, been a healthy dialogue on Internet with many people misrepresenting what we are trying to do. The most common allegation is that Government will somehow use Trusted Third Parties to spy on business! However, our proposals do not seek to control the use of encryption or seek to introduce any new controls on Government access to communications.

PRINCIPLE 7

1. The Commission's *"Green Paper on Copyright and Related Rights in the Information Society (COM(95)382) adopted July 1995"* is the latest stage in an evolving initiative to harmonise copyright laws across the Community and examines a range of issues resulting from the impact of new technologies on Copyright and rights of performers. The Green Paper comprises no draft legislative proposals but seeks to stimulate further debate.

2. The information society has arisen largely from the advent of digital communications technology and this development has sparked the debate on whether existing legislative frameworks in the copyright field are adequate to cater for the many new services and products of the information age.

3. The Green Paper stresses that copyright law must provide adequate protection for authors, composers, performers, producers and broadcasters as well as for suppliers of on-line material, such as databases, multimedia products and so-called "on-demand" data (audio and video works received at a time dictated by the user).

4. The UK sought to influence the content of the Green Paper by sending the Commission a detailed paper on the key issues during the drafting stage (early 1995). The UK position was well-received and was reinforced in a further communication to the Commission in March 1996. Key points are that new technology-specific rules are not necessary and the correct balance must be struck between protecting the creativity of right holders and ensuring an unrestricted flow of the new services.

5. Intellectual property rights was one of four key areas examined by the DTI's Multimedia Industry Advisory Group (MMIAG) of senior Industrialists, which was chaired by Science and Technology Minister, Mr Ian Taylor and reported in 1995. The MMIAG report and the DTI's response were also sent to the Commission.

6. Officials attended the Commission's public hearing (8/9 January 1996) on (a) technical systems of identification and protection of copyright works and (b) acquisition and management of rights. Most recently, the UK was represented at a conference in Florence (24 June 1996) organised by DGXV and the Italian authorities on *"Copyright and Related Rights on the threshold of the 21st Century."*

7. Work is continuing in the *World Intellectual Property Organisation* on possible new instruments to improve, and update for the digital age, protection of copyright and related rights at the international level. A diplomatic conference has been arranged for December 1996 to conclude one or more new multilateral treaties. UK is consulting interests. On piracy, it has been proposed that enforcement provisions comparable to those in the TRIPS Agreement should feature in the new instruments.

Examination of Witnesses

THE RT HON VISCOUNT CRANBORNE DL, a Member of the House, Lord Privy Seal and Leader of the House of Lords, examined. MR GRAHAM JORDAN, Director of CITU, called in and examined.

Chairman

1054. May I say, first of all, on behalf of the Committee what a pleasure it is to welcome you here and how grateful we are to you for agreeing to attend so shortly after taking over the Chairmanship of the Cabinet Committee. I normally begin by asking witnesses if they would like to make an opening statement and if you would like to do that perhaps you would like to tell us what CITU is, what its terms of reference are and what it is setting out to do?

(*Viscount Cranborne*) Yes. My Lord Chairman, I am extremely grateful to you for your welcome. Although I have appeared before Select Committees in the other place this is my first experience before a Select Committee of our House, and I know that the amount of skill and expertise in our Committees makes it a much more difficult and wearing experience. I am, if you like, throwing myself on the mercy of the House particularly, as you say, as I have only just been asked to take over. I wanted, if I might, just to try and set out how after a very short time I see the overall problem and the functions of this rather catchily entitled committee, GEN 37. I think it is clear, at least I hope it has been clear to you so far, that Government is giving considerable thought to the implications of all these new technologies and the information superhighway, how it will affect the future of our country, and of course it is not mere flattery which makes me say that I hope that everybody will see the results of your deliberations as a very valuable contribution to that and we will certainly read, mark, learn and inwardly digest what you have to say. I think perhaps if we can all agree on our objectives. We want a thriving information technology and multimedia industry in this country. We want all our industries to be in a position to seize the opportunities which the new technology offers and to make it work for them. We want every individual to have the opportunity to explore and, of course, to take advantage of them. We think that this emphatically is not a task for the Government alone. On the other hand, the Government does have a very important role. Of course there is a great deal going on. If I may, I would like to give you some opening indication of where I see the Government as having a particularly important contribution to make. However, I think perhaps if you will allow me I would like to make an initial point. You know better than I do how fast the technology is developing. It is moving very fast indeed. I think above all my impression as a relative newcomer, in fact as a complete newcomer, to this strategic view is that one of the main driving forces behind these developments is competition. Governments, therefore, I think would be wise not to plan precisely how technology will move. The likelihood is from past experience that they may well get it wrong. I will come back to that in attempting to answer some of the questions, if I may, which you kindly gave me notice of. Perhaps, as I say, I could emphasise a number of areas where I think this contribution will be from the Government right at the beginning. I think above all that the Government can create the regulatory framework in which the information technology industry can develop and flourish. I am told that information technology electronics and the communications industry as a whole now employs about 1.1 million people in the United Kingdom and already contributes up to 12 per cent of our gross domestic product. The Government, I think, has made quite a considerable contribution to this over the last few years. It has, above all, liberalised the market for our telecommunications and our broadcasting industries and, as we know, that has been given a further step forward in our House when we introduced the Broadcasting Bill during the current session of Parliament. We do think that this has created the right conditions for competition and those conditions will enable the private sector to give us what we hope will become a world class infrastructure. If you will allow me I would like to make a couple of other points as part of my opening remarks. We do think that the Government is also in a position to promote information technology in our schools, in the health service, in art galleries, museums and libraries and a number of other places as well. I think that you are thinking of investigating the situation in our schools. The crude figures are quite encouraging. Perhaps if you look deeper they could be better. We will be looking at that. As far as the health service is concerned, we think that we are doing a pretty good job so far. Most hospitals, I am told, use computers to communicate and store data and I believe that 85 per cent of general practitioner

Chairman *contd.*]

practices are computerised. I think also in the health field IT does offer the prospect of very considerable and fundamental changes in the way that patients and doctors communicate and interact and I think that too is exciting and I hope that you will find that interesting to refer to in your report. Perhaps equally important for those of us who feel that aesthetics play an important part in everyday life and ought to be encouraged to do so, I am encouraged when I go to museums and galleries to see the contribution that IT is now beginning to make in that field. I do not know whether you have had a chance to look at the National Gallery's micro-gallery computer information room and the CD-Rom facilities. I could go on but I think you understand what I am talking about. I think actually it is worth also saying that the National Lottery has made a financial contribution to encouraging that and that is one of the benefits from that highly publicised enterprise. As far as the Government itself is concerned—I finally come to your CITU question—I think the possibilities really are extraordinary. I have come back this morning from a visit to CITU where I was given a very impressive demonstration of what could be possible in terms of interactive systems. There are two aspects of this which I would like to emphasise. The first is that I think it is important that the new developments should be used to above all improve the service to the citizen. It is very easy, I know, to be carried away by enthusiasm for the latest gizmo, and all of us have been guilty of that in our time, but I think if we can use the new technologies to make the Government's service to the citizen more effective, whether it is by one-stop-shop terminals in libraries, for instance, or the provision of very large numbers of other services, for instance the ability to fill out your income tax form and to discuss it with somebody over a link from a terminal, that in itself will be of extraordinary interest. There are a number of other initiatives which could be taken, and no doubt you will want to come back to that. I would like to elaborate a little more on that in due course. I would like, if I may, also to draw your attention to a number of initiatives which the Government has taken in order to try and act as a catalyst for new developments, looking at where the needs are, trying to bring interested parties together, and of course working in partnership with the private sector. For instance, if I may I would draw your attention to the Information Society Initiative which I think the Parliamentary Under-Secretary of State for the Department of Trade has no doubt taken you over so I will not detain you further on that. I think you have also heard about the initiative led by the Education Department which aims to help raise the general level of IT capability in education and is known as the Education Superhighway Initiative, and again I think you have heard about that. The Technology Foresight Programme you are equally familiar with. Of course, if I may, I would like to say a few words about the Committee which I chair. It was established by the Prime Minister on 29 February and its objective is to identify and to take forward important initiatives across departments to ensure that developments in information technology are exploited to the full. The work was begun by the Deputy Prime Minister until a conflict of interest ensured that he gave way to me and, of course, I will do my best to take the work forward. We are talking really about the Prime Minister's vision of a project for the Millennium to try and give everybody the opportunity to try out computers in schools, libraries, shops in the High Street. I think it is extremely important that my Committee should make sure that that effort is properly co-ordinated, not only in terms of the public service but also within the Government itself because we know that individual departments can all too easily go their own way. As far as the public at large is concerned, we do have thoughts about what we call in shorthand "IT For All". We think it is important that the public at large should understand and feel enthusiastic about the possibilities being opened up and that they should be seen to be useful and practicable. I think there is much that is happening already that we could draw to people's attention. In order to explore this further, funnily enough this afternoon, I am meeting a group from the private sector with the President of the Board of Trade to see how we can take this forward. One of the thoughts was that perhaps we could launch an information campaign which draws together under a common banner a variety of activities and initiatives which will make this technology more accessible to all. I fear that has been a rather long-winded opening statement, my Lord Chairman. I will rest there for the moment if you will allow me.

Chairman] Thank you very much. That was, in fact, very helpful.

Lord Flowers

1055. May I first of all congratulate the Lord Privy Seal on having such an exciting job to do. I do not often feel jealous of ministers but on this occasion I do. Lord Privy Seal, you have described many things that are indeed going on, and it is an impressive list, but there is about all of them, that I have seen at any rate, an air of enthusiastic amateurism, if I may put it like that. The technology of what will eventually be the superhighway is being provided, it is being provided in a somewhat unsystematic fashion but it is being provided. What particularly concerns me, however, is not the technology, it is the content, it is what it is used to promulgate. There things are astonishingly patchy. If you look at the information put out by Government it varies from department to department in an amazing way. Until recently at any rate Downing Street did not appear at all but the Deputy Prime Minister did, and so on. Then again there is much talk about providing information technology for schools, a very good thing, but if you look at what the schools actually use it for, if you look at what content is available, you will find there is a lot of frothy stuff which is of interest to the kids, it is very nice if they can see what is going on in Bosnia, it is very important for them, perhaps even for very young children, but if you ask what contribution it is making to the core teaching, as far as I can make out the answer is none. That is not the case everywhere, we saw a quite different state of affairs in one particular place in North Carolina when we visited there a couple of weeks ago. There is no question that content of a meaningful kind can be

Lord Flowers *contd.*]

provided but it seems it is not being, at any rate in this country. What I am working up to saying, and I am sorry I am being rather long-winded, is that it does seem to me that the time has come now when enthusiastic amateurism should give way to rather more guiding, if I may use the word, professionalism. By "guiding", I do not suggest for a moment that Government should start paying for a lot of things but I do think perhaps there is a need for an intelligent visible focus which will provide good practice for everyone concerned, not just within Government but in the community at libraries, schools, citizens advice, health, everything. That seems to be wholly missing at the present time. I wonder whether you would like to comment on that?

(*Viscount Cranborne*) Yes. I think as far as schools are concerned there has been, as I understand it, a fair amount in the way of development by the provision of hardware and familiarisation and indeed the role of the National Curriculum of IT studies. There is no doubt at all, I think, that the Department of Education understands the importance of this. I do not want to trespass, if you will allow me, on departmental ground here but I think if I may I would take issue with you if you imply that this is not being taken seriously. What I would like to do perhaps is to say a little bit more about what you implied about the Government's approach. You said, for instance, that Downing Street had only just appeared on the index. I think this goes back, my Lord Chairman, to your original question about CITU before coming back to the citizen, which was the last point of Lord Flowers' question. I think it was clear that when the unit began to operate in spring of this year the main task was to advise ministers on the development of an IT strategy, the sort of thing that I think Lord Flowers was referring to, so that we could enable the Government to improve the efficiency and the quality of the services and those services that it supplies, as I say, to businesses and the citizen as well as its own internal networks. Funnily enough, the Government has quite a good record as I understand it of using IT to deliver greater efficiency. I agree with you in one sense, that we do need to go much further now and to recognise that IT is making it possible to restructure our dealings, as I say, with the consumer but in a way which will not necessarily align or even recognise the divisions between Government itself internally. For instance, we once had no choice but to deal with clients agency by agency. I believe that IT now makes it possible for the details of Government organisations to become really irrelevant to businesses and the citizen. I think that is rather an attractive prospect. As I say, it holds out the possibility of a one-stop-shop. There have been experiments of a relatively crude kind. For instance, there was one in Bournemouth recently which used an interactive terminal probably in the wrong place, in a Housing Benefit Office I understand rather than a more public place. But nevertheless the level of acceptance by the citizen was gratifyingly high and clearly we want to build on that experience. So you could transact a range of business really from renewing a TV licence to buying a National Insurance stamp and you really need not be bothered about which Government agency you are dealing with. I think it would be sensible to make these one-stop-shops available at public access terminals in places like libraries, post offices, Government offices, shopping centres, and of course the technology as I understand it already exists for it to become increasingly available at home for people. So you could have services available to you 24 hours a day. I think we have been at work really since the early spring on the practicalities of bringing such a thought into being. CITU has been looking at the availability of technology and the costs and benefits of re-engineering the Government to deliver services and looking at how we might finance such a programme. I think before Parliament takes its summer holiday we shall be reviewing how far we have got and taking stock. We need, I think, to act as a co-ordinator to this, as I said, and as you say I do not think the cost need necessarily be very great, we can use private finance and we can also make sure that we share the facilities with private sector businesses as well. On your main point, and then I really have finished, I say to Lord Flowers, with the greatest of diffidence, that I do think it is perhaps unwise for us to be too prescriptive at an early stage about what is going to be the best way forward. My understanding is that these technologies are moving extremely fast and we cannot necessarily predict how they are going to develop and indeed what the emphasis between different avenues might be. For that reason it does seem to us that there is a great deal to be said, as I say, for the private sector to take the lead and for competition to let systems shake down. I am always slightly suspicious about Government taking too prescriptive a role; history shows that very often we have got it wrong and such mistakes can be extremely expensive.

1056. Can I ask the Lord Privy Seal whether he has access to Internet at home himself?

(*Viscount Cranborne*) The short answer is not yet, but my wife has.

Lord Flowers] Touché.

Lord Gregson

1057. You laid great stress, Lord Privy Seal, on access to the citizen, and I understand that, I thoroughly agree with that, but there is a little problem though, it is a damned expensive technology. It costs, on average, about £2,000 to £3,000, probably £3,000, to instal the equipment necessary to have access to the superhighway. The running cost is still very high, it is long telephone calls, etc., from that point of view. You have got at the present time a situation where it is suggested that only five per cent of the population has access and it is not because they do not want it, it is because of lack of money basically. That will go on for some considerable time. Even if commercial provision is made, and I accept that entirely, it is going to be a very expensive thing to hire. For instance, if you want to sit on a set for an hour or two in the cafés that are beginning to spring up all around the country it is a very expensive hobby indeed. As it stands at the moment it is extremely elitist and I cannot see how it is going to improve. If you expect libraries and people like this to do it it is going to cost the Government a

Lord Gregson *contd.*]

lot of money or else they are going to charge for it. It is expensive. This immediately cuts off two-thirds of the citizens from availing themselves of this technology.

(*Viscount Cranborne*) If I may, before I go any further, my Lord Chairman, I have done a discourtesy both to you and to Mr Jordan here by not introducing him as the Director of CITU. I remedy that at once. I would like him to elaborate a little bit on my initial answer to that question from Lord Gregson. Of course, as far as the one-stop-shop that I have referred to is concerned, this would be free at the point of access to the individual citizen. So in terms of Government services, if they go into a library and they find a terminal that would be free. Incidentally, I suspect it will also increase the amount of business available to the library and it might encourage people to read more books so there might be a double beneficial effect.

1058. That costs the Government more money by the way if you do that so you have to be a little bit careful about that!

(*Viscount Cranborne*) Absolutely. I am sure Lord Gregson and I agree that Government expenditure is very important to control and that we can therefore— I will not go down that road, however much he may tempt me! I do think that there is clearly a potential capital expense for the Government here and that is really where the Private Finance Initiative could be extremely helpful. I wonder if Mr Jordan would like to add anything?

(*Mr Jordan*) Thank you, Lord Privy Seal. My Lord Chairman, the question of cost is one which we are paying every bit as much attention to as questions of technology and the kinds of services that might be delivered by information technology. I am encouraged thus far by members of my staff who have been to look at systems in places as far away as Australia and California, that some of the places in the world that have gone furthest in delivering services directly to citizens by use of IT have actually done so because they were pressed financially, did not have the budgets to expand their administrative infrastructure, and actually went down this road because it was cost saving. We do not know yet whether that is going to be the case in the United Kingdom but we are putting a lot of effort into costing both the technology that would need to be installed and the prospects for actually saving on the administrative infrastructure. Whether those two will balance I cannot yet say but we are working on that very hard. The Lord Privy Seal was actually right to lay emphasis on electronic access to Government services being available and free at the point of delivery. The idea in a public library would be that you would have a terminal of the kind which has already been used in experiments which you simply went up to and used. You would have to identify yourself for certain purposes to the system and that may get you into the business of electronic cards and so on. You will be able to go up to it as a citizen and carry out the transaction you want to carry out and then go away. The funding of that terminal, as I say we would have to see how that is done. It may be that the cost, which would be very considerable (your Lordship is quite right that to put these things in every library in the country would be expensive) has to be balanced against administrative savings. We also have to look at the possibility that those terminals might carry commercial services which would mean that the costs would be shared with the commercial service providers of one kind or another. In the longer term there is the prospect of services becoming available in the home. It is certainly true that if one is going to have a personal computer with all the modems and things to link up with a full range of multimedia services then that is expensive. But the Lord Privy Seal and I were looking this morning at a piece of equipment which costs £99, and the cost is expected to reduce, which gives a limited service over a domestic television and normal telephone line. We were actually looking on the Internet at the self-assessment income tax form which the Inland Revenue has got up on the Internet and one can access that. It is a little bit crude but nevertheless the technology is there to bring this kind of access into the home. Of course, how quickly the cost will come down will depend upon the volume of commercial take-up but always it seems that these costs come down really very rapidly. The other point I would make, and again these things are still at a fairly early stage, is that Lord Cranborne has made clear he wants to take stock before the end of the recess, so things are shifting quite rapidly, some of it may actually change over the next few weeks. I would have thought that one would start off by trying to provide these services alongside existing means of access to Government, encourage people to move across progressively. The question would be the rate of take-up and the extent to which the cost savings were balancing the investment in that system. These are big questions we have got to address and we are taking them very seriously.

(*Viscount Cranborne*) It does seem to me that the question of public trust and public acceptance is very important. For this reason I think the pilot schemes are going to be important because they will enable us to ensure that when the whole country is served that it is backed up by experience in different parts of the country including, if I may say so, rural areas. One of the things about rural areas, one of the interesting link-ups we did this morning was a link-up with the Western Isles Council where they use one of these systems to link up with very widely spread communities. I think both the official I talked to and one of the consumers I talked to, who was an ordinary ratepayer, were extremely enthusiastic. Lord Gregson, I know you are interested in rural aspects of this and it is clearly working there and being well received.

1059. One thing that worries me a little is how many thousands of terminals are you going to provide for access through the libraries, etc? One terminal per library would be absolutely useless, it would be a joke, would it not? You would probably need 70 or 80 terminals per library to satisfy the needs of the citizen. It is getting out of hand if you look at it that way in terms of servicing the citizen via that route.

(*Viscount Cranborne*) I am not sure that that has entirely been our experience so far.

Lord Gregson *contd.*]

(*Mr Jordan*) I think it is a little bit difficult to say. I have seen this as a thing which would not occur as a big bang, there would be a progressive migration of people on to this kind of interaction with Government, probably the younger people first but I would not exclude the older people. The experiment in Bournemouth was interesting because although it took the older people a little bit longer to get to use the touch screen terminal which told them about benefits they actually did make that transition and got on with it reasonably well in the end. I would have thought these things would become available alongside the current means of delivering Government services and then we would actually have to see what the take-up was and what the demand was. I would not want to give the impression that one was going to cram the local library full of terminals, they could be in many places, they could be in shopping centres, they could be in Government offices which is where Australia has put most of its terminals, they could be in post offices. I think the issue is the total number required and the cost and the extent to which that can be balanced by the administrative saving involved. We still have to do those sums.

Lord Hollick

1060. Minister, I wonder if you could tell us a little bit more about the remit of CITU and what its objectives are? It seems to have adopted a fairly low profile so far. Is it your intention that it should adopt a higher profile? What would you say were the near-term objectives and if you did adopt a higher profile what aims would you set yourselves?

(*Viscount Cranborne*) I think the objective of CITU is not to take the place of the individual Government departments. I think that the objective of co-ordinating what could become an extremely difficult process is going to be time consuming. My experience of operations of one kind or another is that dealing with the public, and indeed making it clear what our objectives are and how we are achieving them, is a job on its own. It is something that CITU may grow more important over but I would doubt it. It seems to me that what CITU's job is is to manage the co-ordination of change within Whitehall and manage the consequences of delivering the benefits of technology to the citizen. The two are obviously closely linked, as you would know better than I do. For instance, Mr Jordan talked about the revenue savings which will flow from the successful introduction of the sorts of things we have been talking about this morning. Those revenue savings, if they are real, will of course lead to pretty dramatic organisational changes and, I am sure, will have effects on public sector employment. That in itself is a form of change which is going to need internal management and care and sensitivity for public employees. There is going to be a need for training. There is also, I think, clearly going to be a need—how can I put this as delicately as I can, well let us not put it delicately at all—to avoid turf wars within Government. So far, as far as I can make out, the co-operation between Government departments has been enthusiastic and good but of course when it comes to talks about, as Mr Jordan says, paying for these matters then we begin to see blood all over the various carpets. I think that CITU, and indeed my Committee, is going to have an important role in trying to make sure that this is properly managed. I suspect the bulk of it will be the responsibility of the Government departments and the various Government initiatives.

Lord Craig of Radley

1061. Lord Privy Seal, you stressed at the outset that the telecommunications regime had been much liberalised in this country, and we acknowledge that and that has certainly been helpful, but there is a bit of a Catch 22 now in all this. The more that you encourage use of the information superhighway and encourage an information seeking society, the more demand there will be on the infrastructure and yet if there is not enough infrastructure those demands are going to be stillborn or at least lead to irritation and perhaps fury at those who say it is there and you cannot actually access it. We are dealing very much now with what I would call a personalised situation, personalised through the PC, personal mobile phones, personal video demand, personal interactive shopping. How does it appear from the citizen, from the customer, the user end? If he, in spite of what you say about more liberalised telecommunications, is not finding what he wants I think it will start to reflect on Government. Therefore, my question really is do you believe that enough is being done to encourage adequate capacity so that access can be quick and easy rather than, as it sometimes still is, infuriatingly slow?

(*Viscount Cranborne*) Well, Lord Craig, I think you and I can remember the time—to take the basic example which you gave which was telephones—when we had to wait a very long time for the installation of telephones in this country. I think one of the benefits of liberalisation and competition, which we have all had, apart from the decrease in price, has been the fact that it takes very little time at all to instal a telephone and indeed for the different competing telephone companies to provide a higher level of service and indeed access to technologies. Of course, what is going to enable the citizen to be able to take advantage of these technologies, and as you say to have the kit available to use, the facilities available to use, is investment. One of the benefits, it seems to me, of a liberalised regime and competition in bringing other companies into it is that very substantial sums are now being invested in this area in this country. Mr Jordan can correct me if I am wrong but I think the last figure I saw was £4.8 billion a year, which sounds to me like an awful lot of money, and I think it is growing.

Lord Butterworth

1062. I wonder if I could just try and point this up slightly. Might it not be that our regulatory system will result in our getting a number of networks, a number of systems, none of which are up to date, and therefore in terms of international competition we may eventually find that we shall suffer? I understand

Lord Butterworth *contd.*]

that most other countries have got targets for the introduction of broad band and we have declined to do this largely, I understand, on the grounds that we are depending upon the customer, the customer will define his needs and as they emerge then the company will improve the network by the technology that is available. Why is it that we seem to be going one way whereas our competitors have laid down targets in their own countries?

(*Viscount Cranborne*) I understand that a number of other countries are setting targets. France, for instance, has set a target of 2015 for completing new infrastructure throughout France. Japan has set a target date for cabling the country to broad band standards by 2010. What it sounds like to me is that there may be a difference between the target and the clarity of how these things are achieved. We do have targets for some things. For instance, I understand that in relation to the cable infrastructure we have target dates for construction of cable networks which are included as build milestones in their licensing. I also understand that all existing franchises will be substantially complete by 2001. By that time that will cover, it is estimated, about 73 per cent of all United Kingdom domestic housing and of course we will continue to let further franchises. As a result I think that within the next decade our best estimate is that up to 85 per cent of all domestic housing will be passed by cable in the next ten years and of course radio and satellite—I know Lord Gregson is interested in rural areas—will provide a range of services to the rest. On a more general point, if you will allow me to go on, Lord Butterworth, I suppose you could say that setting targets for a national information infrastructure might be looking down a telescope the wrong way. I am going back to a point I made in rather general terms at the beginning. It rather implies an over-simplification and a certainty about our future direction and just what the information society will contain, which perhaps does not yet exist. We know what the benefits are that are emerging from this area, and I think all of us have had our imaginations fired over the last few months, and I certainly have particularly over the last week or so, but I do not think anybody knows what eventual form it will take. There are lots of possible paths towards this information society. Lord Flowers talked about PCs or TV or increased mobile communications, they are not mutually exclusive as I understand it but, as I say, the balance between their relative importance is not clear. Since the end point is undefined I think the significance of the progress down each path we can only guess at at the moment. Some may actually turn out to be dead ends and others will have radical and very long-term effects. Perhaps going towards the eventual information society, which no doubt will be a goal which will recede ever further into the distant future as technology develops, will mean making progress along several paths simultaneously. This is where I get back to the point about the market. I think it is important that the market should pull this and for the demand for services effectively to sustain the development and the investment in development in the infrastructure. That means that perhaps the development will go hand in hand with network development itself. I do not think, in view of all that really, that it makes an awful lot of sense to set hard and fast targets and target dates in particular for any particular infrastructure or any service delivery.

1063. I want to try and help push this a little further. I very much warmed to your point at the beginning that what we have to do is to arrange our affairs so that we create strong international companies because in this field we are all agreed that the market is an international one. Are we quite happy that our regulatory system is one which, whilst it started well, is now adjusted to an international market, or is it so concerned about competition within the country, as between cable and BT and so on, that it is creating competition but not in the right market?

(*Viscount Cranborne*) A lot of this I imagine you might feel has something to do with common standards. It seems to me interesting that the International Telecommunications Union, ITU and European Telecommunications Standards Institute, ETSI, for instance, are organisations which are dominated above all by companies themselves and therefore there is a close connection between standards and the commercial development. I think that in itself may be part of an answer to your question.

(*Mr Jordan*) The Group of Seven nations, I think I am right in saying, I am doing this from memory, one of the projects they have set up in connection with the superhighway is to look at standards for the interconnection of broadband networks.[1] That is being taken forward first for telecommunications networks and then standards are developed, as the Lord Privy Seal said, by ETSI and the ITU. I think what is interesting is the way that the standards for the services that have ridden on the back of existing telecommunications have developed in their own way. The Internet itself is not a thing for which the standards, as I recall, were laid down by any Government, they grew spontaneously by the widespread adoption of standards which were being worked out within the academic community. That is an example of how demand pull can actually spread standards *de facto* on a worldwide basis.

Chairman

1064. Lord Privy Seal, could I first of all say how sorry I am not to have formally welcomed Mr Jordan when he came in with you. That was an omission and I am sorry for it. We have recently, as you heard, visited the United States and seen some of the activity going on there. We are aware that in that country and in Canada national information superhighway task forces have been set up which seem, particularly in the United States, to have galvanised a great deal of

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[1] *Note by the witness*: The Global Interoperability for Broadband Networks (GIBN) project will promote the establishment of international links among existing networks of the G7 and other industrialised countries, and thus provide an opportunity to experiment on interconnectivity and interoperability, as well as to promote rapid development of global standards and encourage the development of new applications that exploit broadband networks. Canada, Germany, the United Kingdom, and Japan co-lead for the implementation of the GIBN project.

Chairman *contd.*]

activity at all levels, in the public corporation, in government, in local authorities, at all levels in society really with the emergence of local champions and the development of quite extraordinary things in what used to be considered backward states, like North Carolina. Would you see any role for a committee of that sort, a task force of that sort, in this country perhaps reporting to you?

(*Viscount Cranborne*) No. I was interested to hear that you have been to Canada and the United States. My impression is—this is reporting only so far—there seems to be a marginally different approach in Canada from the one that has been adopted in the United States, but you would know more about that, as yet, than I do. I do not want to repeat myself too much but I do think that the rate at which technology is advancing and the range of competing options must make it a mistake for the Government to attempt to determine too precisely the technological framework. As I said, our approach really I think has promoted competition and, I make no apology for it, generated an environment in which a whole range of private sector companies can compete and invest. The figures that I have seen for BT alone, I understand they spent £2.8 billion last year on capital investment. I refer back to my answer to Lord Craig. Having said all that, I think it is important clearly for the process to work properly, which I think is behind your question, and we do co-ordinate properly, and there is an opportunity for people's views to be taken into account on that. The Government has taken a number of initiatives to do that. There is this ministerial group on IT, which you mentioned, whose purposes I have tried to explain, and the Multimedia Industry Advisory Group which advises the DTI, which I think my colleague, Ian Taylor, may have talked to you about. That in itself has four sub-groups. Then of course there is the Technology Foresight Initiative, which is one with which you are particularly familiar, my Lord Chairman. There is the Information Society Initiative, which again the DTI has committed £35 million to recently, as well as our own National Information Infrastructure and Task Force which is an industry created body in which the DTI itself participates. I think there is a wide range of bodies to try to ensure that there is proper co-ordination and there is a good level of consultation. I hope that we have got the balance right. I suspect in the end, again I say with due diffidence as a newcomer, this is going to be a matter of balance and we may lean too far one way or too far the other during the course of the coming years.

Chairman] Although we are aware of the New Brunswick development in Canada we did not have the good fortune to visit Canada on our recent expedition.

Lord Flowers

1065. Minister, you are rightly afeared that too much of a role by Government might lead to the freezing of technologies.

(*Viscount Cranborne*) Yes indeed.

1066. When we were in North Carolina what we saw did not amount to that at all, what we saw amounted to the generation of an enormous amount of enthusiasm across the whole community—education, business, Government, everything—for the use of whatever technology had already been provided and was going to be provided. It was not a question of freezing things, it was a question of co-ordinating enthusiasm, if I can put it like that, and as far as possible trying to set out good practice that everyone can follow. That, it seems to me, is what is at present missing from the British portfolio of activities.

(*Viscount Cranborne*) I think the enthusiasm is certainly there. There is no doubt that there is a very high level of penetration of PCs and various bits of information technology in the population as a whole. I am sure that the Government would agree that what you describe is necessary and indeed the Committee which I chair and its supporting official committee is dedicated to doing just that. I hope too, and perhaps this is in the spirit of the technology itself, that the Government will try and be as open as possible about the progress it is making on this. One thing that is absolutely certain in view of what I have said is that the Government is the last person or entity to claim to have a monopoly of wisdom on this, and therefore openness and regular investigation by Committees of this kind as to progress will not only be salutary for the Government but I suspect will be extremely helpful.

Lord Haskel

1067. Lord Privy Seal, we have discussed today how fragmented all our efforts are regarding the information superhighway. One of the things that impressed the Committee in the United States was the fact that the Clinton administration had tried to create a unified vision of a National Information Infrastructure and had laid down nine principles to try and bring all of this work together. We wondered whether the United Kingdom Government has compared how we match up with the United States on achieving each of these nine principles which are identified because it seemed to us that these nine principles drew together all the various facets that we have been discussing.

(*Viscount Cranborne*) One of the advantages, of course, of being given the heads up on what the likely questions are to be is that particularly for questions which demand rather lengthy and complex answers I can produce a written version of the answer which, if I may, I would like to leave with the Sub-Committee for circulation. After the Sub-Committee has examined those answers if you feel they are not full enough or you would like to follow up on them we would be very happy to try and give further replies to any other enquiries. I think what I would like to say by way of verbal answer is this: yes, I think by implication we would accept the nine principles set out by the United States Government are sensible and soundly based and that we would like to comment on all of them. I will not, unless you particularly want me to, run through an answer to every one of them but I am happy to try to if you would like.

Chairman

1068. We should be very glad, Lord Privy Seal, to have your written comments on these nine principles.

(*Viscount Cranborne*) Perhaps I could comment on a couple of them and then perhaps Lord Haskel would like to come back. I think principle two of the universal service concept is an interesting one and again worthy of comment. I am told that OFTEL has recently conducted a consultation on the coverage of the universal service obligation and how it should be delivered. I am equally told that the results rather gratifyingly showed wide agreement on how important it was to retain universal service for basic telecommunications. At the moment, of course, this is defined as voice telephony and some additional rather low level features. In view of the march of technology clearly it is important to keep this definition under review. I think we are also extremely conscious of the fact that if you raise the threshold too high it could have an unfortunate protectionist effect and could actually reduce competition rather than the reverse. So it is a matter of judgment as to the time at which it is sensible to raise that threshold and that is a judgment which I suspect will be one of the more important functions for OFTEL as time goes on. I think the OFTEL enquiry also showed something quite interesting, which was that there was a widespread feeling that there should be an uncoupling of the provision of a higher level of service to schools and colleges from the universal service to customers at home. I understand that OFTEL will be making a statement about that and how they propose to take the educational issues forward which relate very strongly to the emphasis put on educational issues. There are a couple of other areas which I would like to talk about very briefly. Principle three, "Promoting technological innovation and new innovations"; the DTI does contribute quite substantial sums of money, indirectly in the case of European Union programmes, to quite a wide range of research and development and demonstration programmes in this field and I am told that EU expenditure amounts to 3,600 million ecus over five years, so it is a big sum that is involved in this, and our proportionate share of that is about £100 million per annum. So although I extol the glories of private enterprise and private investment, I think one can see from that that we see that there is a role for government and supra-government organisations in this to which the UK taxpayer does make quite a significant contribution. I think that is probably all I would like to say at the moment, but I am sure Lord Haskel may have other comments he wants to add.

Lord Haskel

1069. Just on the last point, I wonder whether you saw an item in the *Financial Times* a week yesterday which pointed out that the financial incentives and tax breaks offered in Europe are far greater than those offered in the United States but that the investment in this kind of business in the United States is far greater in offering its reasons as to why that was so. I found it quite salutary.

(*Viscount Cranborne*) I actually missed the *Financial Times* piece and I will be interested to see it. I can only speculate why that may be so. Overall levels of tax may have something to do with it and, of course, tax breaks imply a targeting by government of a kind which we are rather sceptical about for the reasons I have tried to give. I spent some time living and working in California at a time when Silicon Valley and all that was just beginning. The nature of society, the things that excite society and the role of education seem to me to contribute to an overall feeling of, to use a rather vulgar expression, "can do" of excitement and relaxation; which together with the government's regulatory atmosphere, overall tax level and the rather more liberal view (which worldwide we are now beginning to see is the path in this new age towards creating jobs rather than more traditionalist social market alternatives pursued among a number of our European partners) seem to be in tune with this new age. Certainly, in my experience in America I have observed very much the same sort of phenomenon that you yourself have observed, Lord Haskel, and we can draw perhaps some tentative conclusions from that, although I am sure we would not always agree about them in detail.

Lord Haskel] My Lord Chairman, I look forward to reading the Lord Privy Seal's written response to the questions.

Lord Gregson

1070. Can I ask, Lord Privy Seal, what research the Government is carrying out of the possible benefits and the dis-benefits of having a UK National Information Infrastructure? Could we anticipate some of the benefits that have been anticipated in the US in the Agenda for Action?

(*Viscount Cranborne*) Yes. As I understand it, the UK National Information Infrastructure refers to both the networks, the hardware and applications, which enable business and government and the public to gain access to information. It looks as though this country is among the leading countries in the world in the development of superhighways and their use, and policies across government, we feel, do encompass the US NII idea, again emphasising the promotion of competitiveness. Apart from liberalising the provision of telecommunications which I have already referred to, I think there are other matters which are important: better management of the radio spectrum, for instance, expanding choice of broadcasting and the sponsorship in industry. As far as the government itself is concerned, in November 1994 there was a superhighways command paper (which was one of my first bits of paper which I remember seeing after I changed to this job) amid very substantial excitement on the internal government paper communications network, and this set out a vision of multiple competing and interconnecting superhighways. The idea being that the model was consistent with what I have said so far, that this would be financed by the private sector investment and that it would be fostered by government's commitment to regulatory stability. I think the various items of government initiative that I have described so far go some way towards supporting our basic contention and I hope will deliver the economic benefits we expect.

1071. I have no doubt your wife has suggested to you the frustration of trying to make connections on

Lord Gregson *contd.*]

the Internet and the fact that we have got to have an automatic log-in device to log on to them during the night. It is quite impossible in certain hours of the day to make connections. Does that not indicate to you that our infrastructure is somewhat lacking in that area? As Lord Craig pointed out, if they had to provide all the switching for all our citizens to help themselves to this service all hell would be let loose. Does that not indicate an infrastructure problem that needs to be investigated with some care and persistence?

(*Viscount Cranborne*) As a general principle very rapidly developing technologies always have bottlenecks of one kind or another. I, like you, have heard a number of comments about access. I do not think the answer to that is direct Government action of the kind that perhaps has been organised. I think the overall approach that we describe is likely to unblock those bottlenecks far faster than a more regulatory one, mainly of course because, as I said a moment ago, what we really need to stimulate is investment. I do not know whether Mr Jordan would like to add to that?

(*Mr Jordan*) Of course, it is very easy when surfing the Internet and using hyper-text mark-up language to hop around from one location to another and to lose track of the fact that your pathway may actually be leading you not just through public infrastructure, or indeed telecommunications company infrastructure, but through bits of private computers which may turn out to be a PC in somebody's bedroom and the bottleneck may lie there. I remember doing a demonstration during the lunch hour with some of the staff in CITU and we were having great fun accessing images of pictures which somebody had collected and we were having great difficulty in getting these downloaded. Then we realised that this was actually somebody's private collection and if a number of people were trying to get into that private computer at the same time it was not very surprising that we were having difficulties. One has to be careful; they may be in the public domain but they may not always be.

1072. I do not think some Government departments have difficulties of access actually operating from a bedroom somewhere. It is just as bad for them as it is for the bedroom operators.

(*Mr Jordan*) I think the other thing I might perhaps add, my Lord, is that when one is talking about the terminal that we talked about earlier in the hypothetical public library, I am not sure one would necessarily be using the Internet to make that connection. One would have to make sure that the right kinds of lines were in there to provide the necessary band width. I think by and large one can buy band width quite readily in most cases. Certainly it is easier in urban areas than in rural ones but for much of the population the band width is there if you can negotiate the right deal with the people whose cables you are on.

1073. Could I ask just one small question? You mentioned the liberalisation of some of the airwave possibilities. Certain band widths have been allocated. It is a curiosity that band widths have been allocated in Wales and Scotland and not in England, yet we have more mountain ranges in England than in either of those countries. It is very difficult to understand why somebody stopped short of that.

(*Viscount Cranborne*) I think in the time-honoured phrase, we will have to write to you, Lord Gregson.

1074. I happen to live in the Pennines, by the way.

(*Viscount Cranborne*) You are very fortunate.

Lord Hollick

1075. I was very struck by your statement that you say part of your role is to improve Government service to the citizen. Clearly one way of doing that is to provide Government information electronically. You might say that would help kick-start the whole process. What steps are being taken? Is this an area where you would see your Committee playing a particularly positive role?

(*Viscount Cranborne*) Of course, parliamentary information is a matter for Parliament. I can say in parenthesis that in another Committee of our House we are looking very sympathetically at providing parliamentary papers on the Internet free of copyright and that is something which as Leader of this House, as opposed to a Government Minister, I would greatly sympathise with. As far as Crown material, Lord Hollick, copyright obviously has a purpose. It provides good protection against reproducing official material which could be inaccurate or misleading but what we try and do is draw a distinction between non-profit making material and commercial material. We already waive, as I understand it, or reduce fees where the requested reproduction is for professional, technical, scientific or educational purposes and where we feel that the public interest is in ensuring the widest possible distribution. As I understand it, Acts of Parliament, Statutory Instruments, material like that, we already allow electronic and printed reproduction without charge, or indeed without prior permission. However, when material is being reproduced for commercial purposes it seems a little perverse if people—I am all for profit—should make profit on the back of the taxpayer. We try and make a judgment in our protecting the interests of the taxpayer accordingly. Nevertheless, obviously like everything else in this area it is changing very fast so I think it is right that we should review this situation continuously, if not continuously pretty frequently, and see whether we can develop that copyright policy because obviously judgments here are involved. It may well be that we may need to change those judgments. I think if I can add something else on the subject of Green Papers. We try and encourage departments to place consultative papers in particular on the Internet. We think it is good for open government, to which obviously we are committed, and we have written to government departments encouraging them to do that. I understand that they are responding quite well. The Foreign Office White Paper on the IGC, for instance, I understand is available, as indeed is the Competitiveness White Paper. In the end it is a matter for individual departments. I am sure that encouragement will help.

Lord Flowers

1076. There is a conflict between the need to provide public information publicly and the need to pay for it, especially when the Government has tight revenue targets. Normally in this country it would be for British authorities, including the Government, to decide where to draw that line, but here we are working in the global environment and depending where we draw the line we may find ourselves in Queer Street. An example of this is the United States Library of Congress where access to their very extensive catalogues, 27 million books alone for instance, can be obtained for nothing, whereas the British Library catalogues, recently launched on the Web, are extremely expensive to access. This introduces a very peculiar sort of distortion which if you were to amplify it by imagining such distortions took place all over the place would make the provision of public information exceedingly precarious. I wonder whether you have comments on that sort of issue. I am only using libraries as an example.

(*Viscount Cranborne*) I understand that. Can I try and address the specific example of the library nonetheless, and I understand your using it as an example. Of course, the stock ministerial reply is "British Library's charging policy is for the British Library to determine". I do not think either you or I would be very satisfied with that answer. I am told that the British Library's on-line access catalogue, which rejoices in the acronym of OPAC, is free at point of use. I am also told that the British Library is thinking about increasing and widening its availability. This is something that I again say with great diffidence because I have not investigated this yet. I understand that most free OPACs, including the Library of Congress, do only deliver information about the library in question, therefore it is in itself, in the Library of Congress, fairly narrow. You probably know more about that than I do because I dare say you have used it. That is what I have been informed. As far as the more general point is concerned, access to parliamentary information really is a matter for both Houses and I do not think it is for the government to interfere in that, although individual government members who are Members of both Houses will have views which they can promote. Apart from what I said in answer to Lord Hollick's last question, I think there is perhaps no inherent conflict between Internet access and charging for material because of the nature of the development of priced Internet services. Government bodies themselves are looking increasingly at placing information on the Internet at a charge. I am not entirely sure that we would be wise to suggest that all government information should be free of charge. It is rather like saying that anything that belongs to everybody is usually the thing that is trash because it belongs, in fact, to nobody. In this particular field I suspect that one way of controlling it is to make a judgment about what really should be available freely and, on the other hand, making what seems a reasonable charge to cover costs which in itself will make sure that the service is not abused and out of control.

1077. Thank you for that. I was more concerned with comparisons with other countries and I would not have thought access to the Library of Congress catalogues was exactly trash.

(*Viscount Cranborne*) It is extremely well controlled. It is a judgment you have to make about what genuinely should be available. If I can put on my Leader of this House's hat, I do think that parliamentary government should dictate that parliamentary papers should be as near freely available as possible. There has been an interesting Hansard Society report which I think was commented on in our House some time last year. I tried to give as sympathetic an answer to Lord Lester of Herne Hill who raised a question on the pricing of the printed Hansard, and I think you will agree that substantial progress has been made in that regard, although a number of us would like to see the price of Hansard driven down and I hope the privatisation of HMSO will begin to have an effect on that. The fact that it is likely from now on to be available free on the Internet is going to be extremely valuable from the parliamentary point of view and will be of service to people who want to make full use of the benefits of parliamentary paper.

Lord Craig of Radley

1078. Lord Privy Seal, I am sure you would accept that the availability of information is not just within the United Kingdom, this is a global infrastructure and therefore the availability of it to other citizens is an important point to bear in mind in reaching any view on this. I was very struck by the fact that the United States are helping some 20 African countries with their development of their own information superhighways and so this leads on to the government's perception of how far they should take account of what is going on overseas. A separate example is that in Singapore they are talking about Asian countries either planning or implementing cutting edge technologies, not only to keep pace with their own economic development but to leap ahead of many developed countries. I am sure we would hope that many British industries are going to be taking part in that leap frog and delivering these goods. That again raises the issue of how far should government encouragement of UK industries take place in order to allow for this wider access and this wider market of selling into, say, Asia.

(*Viscount Cranborne*) Clearly it is by definition an international business. The effects on the nation state are going to be very considerable and difficult to determine. For instance, one of the obvious ones is the export or import of rather doubtful material or the effect, for instance, on the elasticity of government revenue from taxation. I hope we ourselves feel that the nature of the beast dictates that we should take a liberal view of regulation and that our view should be that we should try and hold the ring rather than dictate the way things are going. It does not seem to me that the approach that I have tried to describe is incompatible with the international nature. In fact it is rather the reverse. Perhaps I can make one other observation. I understand that a number of Third World countries are nervous, and understandably so, that they would be left behind by developments of this kind. That has often led to difficulties in the ITU, for instance, in agreeing common standards because a number of

Lord Craig of Radley *contd.*]

Third World countries have used that to perhaps slow down this kind of thing. I am perhaps trespassing on Lady Chalker's patch here, which of course is something that she would quite rightly deprecate, but it does seem to me that we should be aware that trade not aid and investment rather than aid is not a bad slogan for Third World countries and I understand a number of them have understood the importance of what I think is often called "leap-frogging technologies" which gives them an opportunity, should they so desire, to push ahead. Certainly, my experience of a number of African countries is that dirigiste economies and Africans certainly do not go hand in hand. Therefore, there are great opportunities there if people realise they have only got to fear fear itself.

Baroness Hogg

1079. Can I take you back to your central co-ordinating role within government and ask you a little bit more about the machinery of CITU and GEN 37 and ask you in particular whether you think this structure of machinery is adequate for these very complex public/private sector tasks we have been discussing this morning. One question that comes to mind is whether you think there is sufficient private sector involvement and whether it could be brought in and, if so, at what level? Clearly it is not within GEN 37 which is making difficult decisions as to what policies should be cross-departmental and what should not. There is some involvement, as I understand it, with CITU, of course, but do you need any other kind of co-ordinating machinery that would bring the expertise necessary into the private sector in bringing forward something like this?

(*Viscount Cranborne*) The straight answer to that is that I really have not been there long enough to make a judgment. In fact, I suspect that a number of these services will have to be contracted out to the private sector companies and that in itself will provide quite a useful interface, and indeed rather more an interface which will bring the private sector into what the Government does. Mr Jordan, perhaps I can turn to you for a bit more elaboration?

(*Mr Jordan*) Perhaps I might say two or three things about the private sector. Firstly, it was the wish of ministers that when CITU was set up it should have within it people on secondment from the private sector. We are actually about 50:50 private sector, or ex-private sector I should say because they are temporary civil servants, and public sector people. There are two further things I should say. We have, since the end of February, been responsible for the Private Finance Initiative in the information systems, information technology area. Clearly both because of that and because it is Government policy we have been thinking, and the Lord Privy Seal mentioned this earlier, about how the kind of service delivery I talked about can be provided by private funding. The other thing I should say is that ever since we started work in the late spring we have been engaged in an ongoing confidential dialogue with the private sector, both those who might have a technology which is relevant to the kinds of things we are trying to do and also those companies which might in due course want to offer private capital as a means of bringing some of these things to fruition. We want to make sure that the kind of service delivery that we are developing for the ministers to consider is of a form that the private sector can play its part in delivering in due course. Clearly, of course, if this thing goes forward then there will have to be open competition on all those things that have to be there. I think that informal consultation at this stage, including the various representative bodies of industry, in order to make sure that we are not missing any tricks, and we are not putting any unintended obstacles in the way of making use of the private sector as a partner in all of this later, is the right way to go and that is the way it has gone.

1080. Finally, on the outcome perceived by the citizen, on what sort of timescale could you envisage, as it were, a single "front end" cutting across the provision of individual departments? The implication of that is whether delivery through this means by departments, and such matters as whether a consultation paper is available in this form or not, will be universal across Government?

(*Mr Jordan*) I think you are absolutely right to identify a "front end" as an important part of service delivery. It is necessary for obvious practical purposes. If one is going to have the Inland Revenue and the Department of Social Services providing services among many other Government departments over some kind of a terminal, clearly one does not want to go into a public library and find you have got one terminal for one and another terminal for another. One has to have some kind of electronic "front end". The Chancellor of the Duchy of Lancaster has referred to it as a kind of electronic post office where a range of services could be transacted. The timescale for putting that sort of thing into place is a little bit difficult to be precise about. One has to do some pilots because one is going to want to see what kind of presentation or "front end" people will feel comfortable with. It might be possible to think in terms of launching some of those pilots within months rather than years. Beyond that, one is going to have to see what the level of public acceptance is and one is then going to have to engage in some quite protracted discussions with the private sector in order to get the right kind of partnership. Of course, all of this is subject to ministerial decisions which have not yet been taken. I would have thought that one is talking a few years rather than a few months to get this kind of thing into place. That is a personal view, as I say. Ministers no doubt will want to influence that timescale.

(*Viscount Cranborne*) Can I perhaps add to that. It seems to me that the potential benefits from this are enormous. I am sure Mr Jordan is right in that trust and acceptability are extremely important and we are both trying to emphasise that. We also ought to be aware, as I think I answered to Lord Hollick, of the internal effects this is likely to have on the Civil Service and the organisation of Government. Having said all that, the technology is clearly there and there is no reason why it should not be developed even while the existing technology is being used to deliver services to the public, as has always been the way. I would hope that very properly Mr Jordan's caution

Baroness Hogg *contd.*]

can be tempered by ministerial enthusiasm to get this together. I would certainly say to Lord Hollick that one of my Committee's jobs will be to try and—I do not want to be over-flippant about this—put a bit of rocket fuel into it.

Lord Gregson

1081. I think I have already raised the problem of the "haves" and the "have nots" and the "cannots". The division is very sharp at the moment. We have been told that the average income of a family who have got a computer in the home is £45,000 a year which gives you a 95 per cent cut off if you give this as a straight illustration. That is an awfully small divide and an awful lot of "have nots" and "cannots".

(*Viscount Cranborne*) I understand that. One does not want to strain credulity with comparisons, but there is no doubt, is there, that innovations generally are expensive but that volume is a great decreaser of price. I think we have seen endless examples of this. Very few people could afford a motorcar in 1905. Now a number of people seem to think that too many people can.

1082. Yes, it is almost a pity now.

(*Viscount Cranborne*) I think the example that Mr Jordan gave of the £99 piece of kit which will actually enable you to introduce interactive capability into your own television set is a very good example of this. I have great faith in the power of volume to give accessibility. I think we have seen that in our own experience over the last couple of decades. The only thing I would add is, of course, you do need people to feel that they want the kit to create the demand. I do think this is where education does play a very important part and it is something that, as I said at the beginning, the Government does take very seriously and will develop.

1083. Perhaps I could add two comments to that. Firstly, we are dealing here with information to the citizen which is a very fundamental subject. It is not like having a television set for entertainment. You can possibly run some of the services of a country on the basis of electronic information and that becomes a different matter altogether. Secondly, the cost factor is so steep at the present time it is going to take a long long time before it becomes available to the citizens, so there is still a problem for a long time to come.

(*Viscount Cranborne*) I am not wholly sure that I go along with all of that, Lord Gregson. In terms of information to the citizen, I have already said that we would hope that these terminals would provide information freely at the point of access, but I think we also need not be too hard and fast in dividing frivolous entertainment from good solid worthy information and government. After all, one of the beauties of these systems is that you can switch between the two and choose from your menu what you want. For instance, it is perfectly possible with present technology for you to call up a video from a video store and enjoy that and at the same time call up the local railway company and book a ticket, an experiment which I understand is being undertaken in Cambridge. This is a means rather than a hard and fast end in itself. I actually suspect that price will increasingly not be the difficulty that you anticipate.

Chairman] Lord Privy Seal, Mr Jordan, thank you very much indeed for that very helpful evidence. We shall look forward to receiving your written comments on the nine American points and indeed any other points that you would like to send to us in writing. Thank you.

WRITTEN EVIDENCE

Memorandum by the Heads of Departments and Schools Committee of BAILER

1. WHAT IS THE CURRENT FORM OF THE "INFORMATION SUPERHIGHWAY", AND HOW IS IT DEVELOPING (i) IN THE UNITED KINGDOM AND (ii) WORLD-WIDE? WHAT SPECIFIC PROBLEMS ARISE FROM INCOMPATIBLE NETWORK STANDARDS AND WHY ARE THESE INCOMPATIBILITIES ARISING?

The first and most fundamental point to be made about the Information Superhighway is that it is now supranational. This fact affects a number of the questions raised by the sub-committee, which treat of the Information Superhighway as something that might be fundamentally affected by UK Government action. The Information Superhighway (IS) (although it is far from being a superhighway in any real sense at present) will develop internationally with or without actions by the UK Government. All Government action can do is to increase or retard the speed at which the Internet penetrates every aspect of business and social life in the UK.

At the heart of the IS idea is the Internet, an international network of networks, of widely varying extent, ranging from national academic networks such as SuperJANET to smaller company or institutional networks. The Internet is developing through the accretion of additional networks to the Internet at a rapid rate—estimates for which vary considerably. The Internet will continue to develop in this way; for all practical purposes indefinitely. Other communication networks are capable of being connected, and are being connected to the Internet, to create a true IS. This includes cable services, consumer on-line information services, wireless communication services, and so forth.

As far as Government action is concerned, the opportunity was missed ten years ago when the idea of a national fibre-optic network was proposed by McKenzie in *Sunrise Europe* (1986). McKenzie argued that public investment in such a network, extending to every home, school, factory and business premise in the country, would provide Britain with the necessary infrastructure to compete effectively in the global economy. That opportunity was not taken and, as a result, we have (apart from the telephone system) a patchwork collection of networks, driven solely by commercial opportunism, provided by cable companies, Mercury and BT. Even the telephone systems, although they are now largely digital, have implemented ISDN not as a mass national service, but as a highly priced, additional service to business. No national plan for the development of the network exists and when market forces determine the information content providers it is little surprise that the major providers in the UK are American owned—CompuServe, America OnLine and the Microsoft Network. The openness of the UK information industry to take-over by foreign companies and the exploitation of the UK market by companies that export the profits has clear consequences for the balance of payments.

The question of non-compatible standards is not an issue, since, by definition, a network based on non-compatible standards will be unable to interact with the IS. Such problems as exist will only be resolved by network "owners" adopting compatible standards. All Government action can achieve in this respect is to publicise the benefits of common standards. It might make a strong move in this direction by ensuring that networks in Government departments and, to take a special case, the NHS, are compatible and connected—with adequate security being provided, where, necessary, by "firewalls".

2. WHAT SERVICES ARE BEING PROVIDED, AND SHOULD BE DEVELOPED/WILL BE REQUIRED, WITHIN, FOR EXAMPLE, THE FOLLOWING AREAS:

(i) public information
(ii) commerce
(iii) finance
(iv) education
(v) industrial training
(vi) health
(vii) social services
(viii) entertainment?

We do not have sufficient expertise to comment in detail on all of these areas, since the research that would guide a response, with certain exceptions, has not been carried out. This, in itself, is an indication of the Government's lack of strategy in this area. The body that has funded research into information content services and the needs of information users is the British Library R&D Department. This Department has been under-funded for years and its present research grant of £1.3 million (cut by £300,000 in the current year) now buys less than half of the research it supported in 1979. One of the reasons for this is its location in the British Library—it serves the function of a research council, but without research council status, and it serves as a Government research unit, but far away (organisationally) from the centre of decision-making in

Government. This may be contrasted with recent Finnish government action in launching its *Information Research Programme, 1996–2001* through the Academy of Finland (with Ministry of Education support) with funding of up to 60 million Finnish Marks for the first three years.

However, it is possible to make some comments: first, Internet-based information content services are in an embryonic state, although the main providers of consumer on-line information services are all making efforts to integrate their services with the Internet and some of the major financial and business information services are doing likewise. It seems evident, then, that these commercial providers (largely US in origin, with the exception of Reuters in the UK) will continue to dominate the market.

It is also likely that these providers will deliver at least some of the content across all eight areas mentioned in the question, although the extent to which this content will be of UK origin is, at present, unclear.

It is also likely that the present convergence of entertainment, information and education, through commercial agreements such as those between major Hollywood studios, computer software companies and computer games manufacturers will continue and that "infotainment" and "edutainment" services will be developed over the IS. This is already happening as, for example, magazines turn into Internet-based multimedia products and as the boundaries between advertising and entertainment become blurred in "cyberspace".

The areas that most concern us are those of public information and education and training. In relation to the first of these, existing community information services, such as those offered by public libraries, Citizens Advice Bureaux, legal advice centres, and the information services provided by voluntary agencies in the health and mental welfare fields can provide a sound basis upon which to build electronic community information systems. The danger is that because these services are at present operated largely on public funds and voluntary donations, their potential for conversion to electronic form will be ignored and that attempts to provide alternative commercial services to the citizen will fail. Political decisions are needed that support a public presence in this sector and that ensure that any commercial services are not monopolistic and are not priced at levels that result in an information underclass in society.

With regard to education, the benefits of computer-based teaching and learning are yet to be proved. There is a danger that these will go the way the rooms full of "teaching machines" of the 1960s, where crude ideas of teaching and learning based on little more than Skinnerian stimulas/response models were implemented, without notable success. It is clear, however, that more sophisticated, multi-media information resources can now be made available to learners and that remote consultation with tutors will allow students to study at a distance. Research suggests, however, that students will continue to demand face-to-face interaction with teachers and that education will remain an intensely interpersonal activity.

As for the services required by education to implement machine-based learning, the programmes initiated by the Higher Education Funding Council (the Teaching and Learning Technology Programme (TLTP), the Computers in Teaching Initiative (CTI), and the Follett Implementation Group for IT Programme (FIGIT)) will point the way to services that can be developed collaboratively for the benefit of teaching and research in higher education. The potential of the SuperJANET network to deliver learning resources throughout the UK would be a source of considerable strength, were it not for the fact that the financial pressures on institutions have seriously eroded their capacity for innovative teaching and learning experiments. All organisations require a degree of "slack" to enable innovative ideas to be pursued and the slack that might have existed has been driven out by so-called "efficiency savings"—a euphemism for cuts in resources which have reduced academia to what even a former Government minister for higher education has described as "pauperisation".

The case of industrial training is rather different. At present, a wide variety of agencies is involved in such training, ranging from the further education sector to commercial training organisations specialising in the middle management area of the industrial spectrum. The training itself may range from training in electronic and mechanical skills, through skills-based training in clerical occupations, to higher management training seminars in human resource management and selling. There is little doubt that a great deal of this training, especially that which does not involve access to anything other than a computer, could become computer-based. Perhaps the exception is that which relies upon the intense interpersonal atmosphere generated by the prevailing management guru and that which requires an interpersonal setting for the development of, for example, training skills, selling, and interpersonal skills generally.

It is likely that the existing commercial companies in the industrial training sector will move into "cyberspace" and may be followed (or led) by the large management consultancies and the computer software houses, such as Microsoft, which already have considerable computer-based training resources themselves. Microsoft, for example, is already offering training in computer subjects through its Microsoft Academy on the Microsoft Network.

3. WHO WILL SUPPLY THESE SERVICES TO CONSUMERS IN THE UNITED KINGDOM? HOW CAN THE PARTICIPATING COMPANIES BE CATEGORISED AND WHAT IS THE NATURE OF THE COMMERCIAL RELATIONSHIPS BETWEEN THEM? HOW ARE SUPPLIERS LIKELY TO DEVELOP? WHAT SERVICE STANDARDS EXIST AND HOW ARE THEY LIKELY TO EVOLVE?

This is an impossibly large question to answer briefly and demands, in part, a knowledge of the future that is unattainable. However, (apart from the comments above) brief points can be made under the following headings.

— financial and business services: provided by companies such as Reuters in the UK and Dunn and Bradstreet in the USA (although both operate internationally). Both companies have developed on the basis of providing access to company information and stock-exchange data. They could develop further as general news agencies or as specialised business information analysis services. In this sector only company service standards exist and these are driven by responsiveness to customer needs;

— the "on-line information services": these have developed mainly on the library market and, particularly, on the special library market in business and industry. They are now moving towards the mass-market, making tentative explorations of the Internet and the World-Wide Web. They deal increasingly with full-text information resources, provided by information providers who are also exploring independent delivery through the World-Wide Web. Two tendencies are evident: the emergence of large on-line "hosts" (eg, Knight-Ridder in the USA, ESA-IRS in Europe) providing access to thousands of data-bases; and, potentially, a fragmentation of provision as the information content providers seek markets independent of the hosts;

— the "consumer on-line information services": mainly US-based (CompuServe, America On Line, Microsoft Network) but with attempts to create UK and European content, and with new providers emerging in Europe (UK Online; Europe Online). These services are now facing direct competition from the Internet and, particularly, the World-Wide Web and are making considerable efforts to migrate their services is this direction, In the UK, the market for such services is embryonic and, as a result of the pricing policies of BT, may remain so. The tendency is likely to be for a single English language provider to emerge, based in the USA but with considerable UK content—at present America OnLine is the principal candidate;

— public and community information services; because of the pricing policies of telecommunication services these have been relatively quick to emerge in the USA in the form of Community Nets or "free-nets". Some State authorities, eg Maryland, have been particularly vigorous in promoting community access and these may provide a model for the UK.

4. HOW CAN UNIVERSAL ACCESS TO SERVICES PROVIDED FOR THE COMMON GOOD BE SECURED WITHIN A COMMERCIALLY COMPETITIVE MARKET FRAMEWORK?

The comments embodied in evidence to the Federal Communications Commission's Joint Board on Universal Service from the Center for Civic Networking (CCN) and the Graduate School of Library and Information Science (GLIS) at the University of Illinois Champaigne/Urbana are relevant to this issue.

The evidence outlines a "Universal Service framework" that provides:

— "Market incentives and individual tax credits to increase computer ownership among low-income households and microenterprises;

— Electronic mail services for low-income children and job-seekers;

— Development of public access network services that offer useful and beneficial information products and services that address community needs and civic life;

— Mechanisms to finance network literacy programs through adult education programs, public libraries, and schools;

— Improved Federal data collection on the individual use of networked information."

These are precisely the kinds of initiatives that need to be taken in the UK, but which are unlikely to evolve from a purely market approach to the development of information networks. The extent to which community goals need to be recognized by Government is evident, but the present ideology is opposed to the construction of such goals and their attainment through collective, public action.

A good example of the impact of public sector purchasing power is found in the collaborative purchasing of software by universities through CHEST and of access to large datasets through BIDS and EDINA. Such collaborative action seems to work in favour of the commercial sector and, given the network of publicly supported library systems it ought to be possible to develop similar arrangements for information access for them.

In some areas, for example health information, information for carers, etc, information services may not be profitable and, if the emergence of an information underclass is to be avoided, public investment may be unavoidable.

5. WHAT IS THE ROLE OF CENTRAL GOVERNMENT IN CONNECTION WITH "INFORMATION SUPERHIGHWAY" SERVICE PROVISION, INCLUDING THE FOLLOWING AREAS?

(i) *leadership*

A Government role in leadership would imply that Government had some vision of the future of electronic information systems and services in society. There is no evidence that this is the case. Government could set a lead for business and public sector organizations as a "model user" in a number of ways:

- it could create a unified structure for information systems and services across Government: this is unlikely to happen because of the power of the major departments of state who will jealously seek to preserve their "rights" over their information resources and information functions (as the manner in which the National Commission for Libraries and Information has been established demonstrates);
- it could clarify the perception of information in Government by removing the term "information officer" from its PR staff, thereby revealing their true function in Government: this is not likely to happen because it would expose their true function;
- it could bring responsibility for information policy and research into the centre of Government, say, the Cabinet Office, thereby demonstrating true commitment to the ideas that underlie phrases such as "the information society", "the information economy" and the Information Superhighway: this is not likely because there is no one, so far as can be seen, with any vision of what an information society may be. This compares poorly with creativity shown by the Governments of, for example, Malaysia and Singapore.

(ii) *access to Government information?*

Past Government policy has been to treat Government information as a tradeable commodity and departments and agencies have been encouraged to develop commercial, for profit, information services using business partners where possible. The effect of this has been seriously to reduce public access to such information, since the costs have risen to levels that inhibit private purchase (or, in some cases, access to the relevant databases) or purchase by public libraries. We now have a situation in which Government (and, therefore, public) information is being published not for the public good but for private gain. In the view of many this is an abrogation of the Government's responsibility to the citizen. As a consequence of these developments, the Government's scope for action is limited, unless existing commercial contracts are either renegotiated or terminated. Given that most Government information is now produced in electronic form (even if only as word-processed text) it would now be possible to achieve widespread electronic dissemination of such information to the general public good using the facilities of public libraries, legal advice agencies, the Citizens' Advice Bureaux, and other publicly accessible services as delivery points.

Recent Government action has done nothing to convey any understanding of the potentially valuable role that the kinds of agencies mentioned above can (and do) play in the dissemination of information to the citizen. For example, the DTI initiative designed to provide information to small and medium-sized businesses ignored the existence in every local authority in the country of the central and branch public libraries (many of which were already providing business information services) and, more recently, the findings and recommendations of the Public Libraries Review appear to have been completely ignored.

(iii) *data protection, confidentiality, censorship?*

The UK does not have open government; it has no Freedom of Information Act and the provisions of the Data Protection Act that provide for citizens' access to personal information held by Government departments and other organizations, are being negated by the high charges imposed by such bodies for searching and reporting.

Any action in these areas beyond those covered by existing law, therefore, is bound to be viewed with suspicion as likely to lead to even greater suppression of information than already exists. A defence of protection of confidentiality will be viewed as simply another attempt by Government to maintain secrecy in its affairs. From Weber onwards, the control of information, has been recognized as one of the chief sources of power in bureaucratic organizations and the Government is archetypal in this respect.

As for censorship, any Government action to censor content will be negated by the supranational character and genuine openness of the network.

(iv) *verification of information?*

We assume that by this phrase is meant verifying the accuracy, validity etc of information available through the Internet. The only area in which Government action can be relevant here is in verifying the accuracy and validity of its own information. Even here, given the lack of a national information policy and the wide dispersion of responsibility for information in the Government departments, it is likely that Government would find it difficult to guarantee the accuracy of its own information.

We do not see any role for Government to verify the information provided by others, but it might support the development of other agencies to encourage quality in information services. For example, the Centre for Information Quality Management is supported to a modest extent by the Library Association and the UK Online Users Group and is in discussion with some of the larger UK database providers to label the quality of their products. Further support for initiatives such as these would be an indication of the seriousness with which government takes the issue.

(v) *promoting development of UK-oriented software?*

Software is not the critical issue in the impact of the Internet on society generally. The critical issue is the development of "information content services" that meets citizens' needs and market demand. This is discussed further in response to Question 7.

6. WHAT IS THE ROLE OF LOCAL AND REGIONAL GOVERNMENT IN CONNECTION WITH THE "INFORMATION SUPERHIGHWAY"? HOW CAN NEW SERVICES BE USED TO BOOST (A) THE ONGOING REGENERATION OF URBAN AREAS, (B) OTHER LOCAL ECONOMIES?

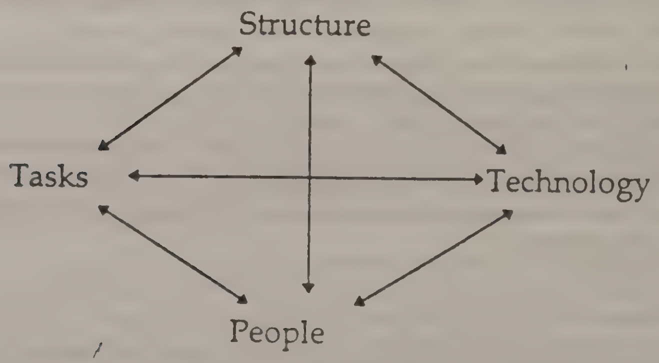
The very universality of information needs and information services would seem to militate against the use of the IS as a means for the direct regeneration of urban areas and local economies generally. Information content providers may, of course, be scattered throughout the country and, indeed, throughout the world, but it is highly unlikely that access to essentially local information resources would provide a sufficient basis for the development of a local "industry".

In any event, since, by definition, the information must be in electronic form to be useful—or must be convertible to such form—it is evident that local information could be transferred anywhere in the world for value-adding work to be carried out. The role of India in providing computer programming skills to Western business may be taken as an analogy. To use Negroponte's idea: when bits rather than atoms are the raw material of production, where the factory is located is a matter of economics. An information factory is not like a 19th century steel works that required adjacency to wood, coal and iron ore.

On a modest basis, however, the public sector is already involved in developing information services: for example, Gateshead Public Library produces a talking newspaper for blind persons, and is involved in delivering videotex services in collaboration with a cable company. More initiatives of this kind ought to be stimulated and supported.

7. WHAT WILL BE THE IMPACT OF THE "INFORMATION SUPERHIGHWAY" ON WORKING PRACTICES AND EMPLOYMENT PROSPECTS?

The IS is simply one further development in information technology that will impact upon the workplace. However, its impact is highly dependent upon the implementation of organizational networks that can be connected. It must be recognised that, at present, British business and industry have been slow to adopt networked office systems that support the individual manager and worker. There is a degree of caution in large organizations about the implementation of such systems when grandiose schemes go awry at the cost of millions of pounds. It is also seen that the full effective implementation of organizational networks depends upon changes in virtually every other aspect of organizational work. There is a general awareness that the "Likert diamond" (below), which shows the inter-relationship of organisational variables, is a true model of the situation and that changes in techonology demand changes in structure, people and tasks.



In small and medium-sized businesses, and in the public sector, the cost of implementing networks, where the benefits are difficult to determine and where the cost of organisational change may be high, is also a barrier to installing the necessary infrastructure. The pace of change, not only in technology, but also in the business environment, is a further impediment.

The introduction of networks in organisations also has major implications for the ways in which information flows throughout the organisation. Typically, the role of middle management is diminished, since their reporting functions are removed, leading to resistance on their part to the introduction of systems, and the implications generally for more open information access in the organisation are difficult to accept in centralist, bureaucratic organisations, particularly where autocratic management styles are adopted.

It would be unwise, therefore, to anticipate any radical and immediate impact of the IS on working practices generally. The impact in the educational sector, however, is already taking place and is proceeding rapidly in those institutions that adopt collegial, distributed decision-making styles of government. Such styles fit the function of networks.

The impact on employment prospects is even more difficult to determine, since it will depend critically upon the development of "information content services". At present these exist in three main forms:

- financial and business services, such as those reporting real-time stock market prices, company financial data, and financial and business news (of which those provided by Reuters are a prime example);
- the "on-line information services" which are dominated by US firms such as Knight-Ridder and which deal chiefly in bibliographic and full-text databases; and
- the "consumer on-line information services", which, again, are mainly provided by US companies such as CompuServe and America OnLine, which are making considerable efforts to buy local, European content. Over the past year a number of European services have started (UK Online, Europe Online, etc) but their impact on the market has been limited and their future is uncertain.

The major publishers are now showing a somewhat belated interest in the potential of the IS for the delivery of their products, but issues of pricing, security and intellectual property rights are slowing the rate of progress. In the scholarly communication sector we also see the emergence of "free" electronic journals, produced by individual scholars or by informal groups, that represent the first real threat to the existing means of publication.

These developments suggest that employment prospects, at least initially, are going to be only minimally affected by the increasing penetration of the IS into social life. First, because the commercial risks of starting information content services in an area where the US dominates are uncertain but high. Secondly, because employment in this sector will demand levels of education and technological competency that this country is having difficulty in meeting. Thirdly, because demand is constrained by the unplanned development of the network and by the pricing policies of the main telecommunications provider, BT.

There is also the wider problem, addressed by virtually every commentator on the "information society" of the likely general increase in unemployment as a result of increasing "intelligence" in computer-based systems in business and industry, and in the reorganisation of work to take maximum advantage of such systems through "business process reengineering". Whether an expansion of the information industries can replace lost employment is questionable, since work in these industries requires cognitive capabilities of a higher order than those required for other modes of production.

8. IS THE DOMINANCE OF MASS-MARKET US SOFTWARE A THREAT OR AN OPPORTUNITY? WHAT HARD COMMERCIAL INITIATIVES CAN BE MADE (AS OPPOSED TO "COLLABORATIVE" VENTURES SUCH AS RACE OR ESPRIT) TO RESPOND TO THIS DOMINANCE?

As noted earlier, software is not the main issue. That battle has been lost, largely as a result of past Government decisions that led to the demise of the British computer industry. The market of Internet products (such as Web browsers and servers) is dominated by US companies and there is no evidence of any significant business interest in the UK in finding and developing new products in this area. It is highly unlikely that any new, "killer" product can emerge out of either European or UK commercial initiatives and it is worth reflecting on the fact that the last such application, the World-Wide Web, was created by an Englishman working at CERN (as a part-time, unfunded project), but developed in the USA by the National Center for Supercomputing Applications and, subsequently, Netscape. The UK Government has no vision that would support a centre such as NCSA and UK business has no entrepreneurial spirit that would adopt the free distribution stategy of Netscape as a way of gaining market acceptance.

These facts point to the dilemma in the question: RACE and ESPRIT were intended to develop "near-market" ideas into collaborative European products. In that, they have largely failed: business developments elsewhere, implemented more rapidly than the cumbersome bureaucracies of Europe allow, have overtaken them. On the other hand UK business and industry devotes insufficient resources to R & D to encourage innovative products and industrial inventors must look to the USA for financial support, since the UK financial institutions look for high, short-term returns, rather than long-term growth.

In other words, the problems of the UK as an incubator for innovative products and ideas are systemic and unlikely to be solved through programmes that deal with symptoms rather than causes.

Professor T. D. Wilson
University of Sheffield
on behalf of the Heads of Departments and Schools Committee of BAILER.

Memorandum by the British Embassy, Paris

NOTE ON GOVERNMENT POLICIES IN FRANCE

Wide public interest in information superhighways really started in France in 1994. Parliamentarians discussed the opportunities and threats offered by broad band communication networks, with leaders of technology based companies and with service providers. Many conferences were held on the subject. The left wing newspaper *Libération* started regularly to include a separate section called Multimédia.

In November 1994, the French Government issued a call for project proposals on information superhighway topics; 635 proposals were submitted. Decisions about funding were delayed because of the 1995 election, but in October 1995 the Government announced its decision to support 170 projects which it considered to be of public interest. Before some projects could go ahead, changes had to be made to French law in order to lift certain restrictions on provision of services.

Under the auspices of the Parliamentary Office for the Evaluation of Scientific and Technological Choices (Office Parlementaire d'Evaluation des Choix Scientifiques et Technologiques), members of the two legislative houses here, the Senate and National Assembly, held a number of important round table debates on aspects of the superhighway.

At the round table on "The Information Society; certainties, concerns and hopes" in October 1995, the Minister responsible for telecommunications, M François Fillon indicated the broad direction of French policy. He made the following points:

- it was important to look not only at the promises offered by developments in information superhighways, but also at the threats. One role for Government was to help to reduce the risks and uncertainties in order to provide a supportive climate in which companies could develop multimedia products;
- France faced the risk of foreign domination in the provision of services on the Internet;
- The key steps necessary were to improve the quality of the networks infrastructure, to encourage development of multimedia services (including those in the French language); to solve the problems of security associated with payments; to move towards digital techniques in the audiovisual field;
- The French should migrate, gradually, from the existing Minitel terminals to multimedia. An intermediate stage would be necessary where PCs, TV and Minitel would all be in use side by side;
- France was in some ways in a good position to take advantage of the advent of the information society, by virtue of technical strength in telecommunications companies, in academic and industrial research and, in particular, in the national informatics research organisation INRIA. INRIA had been selected to be the principal European focus for the World Wide Web. (INRIA is a major partner in research projects on superhighways and a list is attached at Annex A);
- However, France had a number of handicaps, including the low level of take up of computers in homes compared with the UK and US; and the domination of the superhighway by the English language;
- The French experience with Minitel terminals (which had been given free to households in the 1980s) could be seen as an advantage since it had enabled almost everyone to use a keyboard and screen to obtain information electronically. 1.2 million households in France had used Minitel regularly to purchase items, compared with only 800,000 American households who bought items via computer;

In March 1996, the Minister François Fillon announced that the number of public interest projects being supported had increased to 244 and that Government spending would amount to FF 50 million (some £6 million) in 1995 rising to FF 270 million (£30 million) in 1996. The necessary law had been passed to permit special licences (of limited duration and confined to specified geographical areas) to allow the experiments to go ahead. He announced that telephone tariffs would be changed so that everyone, throughout France, could access Internet for the price of a local call. In order to encourage organisations to introduce new technology, purchase costs of microcomputers and multimedia services were to be amortised over a shorter period, namely two years. He also announced that the State would lead by example in that, within two years, all Ministries would make Government information available in French on Internet.

In a speech on 14 June 1996, to local authorities, M Fillon emphasised the importance of matching multimedia services to the needs of consumers, and he underlined the benefit of involvement of towns, Departments or regions. Local authorities are active partners in more than 25 per cent of the 244 projects and are expected to contribute FF 500 million (£70 million) out of the total national investment to FF 4 billion (some £500 million). Locally-based projects are expected to enable the regions to build up capability which will be nationally and internationally competitive in due course. Most of the experiments will offer video on demand; educational and cultural services; professional and shopping services. Some offer voice telephony and interactive video.

The Ministry responsible for telecommunications has established a permanent help-line for project participants which will give them access to technical expertise. The Ministry will also be setting up a group (observatoire) to evaluate the experimental projects. Membership will include regional and industrial representatives as well as Parliamentarians and professionals.

In order to encourage small and medium size firms, the Government's technology transfer agency, Agence Nationale de Valorisation de la Recherche (ANVAR) (which has regional offices) has called for project proposals from SMRs. A budget of FF 90m (£11m) will be available for SMR multimedia projects. The initial demand has been very high—which has been taken to indicate that all types of small enterprise in France are keen to take advantage of multimedia developments.

M Fillon often mentions the need to ensure a French language presence in multimedia services. Consequently his Ministry, jointly with the Ministry of Culture, will spend FF 30m (nearly £4m) to support development of on-line services and new products including optical storage. The aim is to pump prime products with the expectation that the market will develop. The Ministry of Culture already has sizeable databases accessible on-line via Internet including one on museums which has 120,000 pages of text and images. The Louvre museum has its own separate Internet server. A database for researchers includes details of all French archaeological sites, with photographs.

In June 1996, M Fillon looked back on the past year and reflected that there had been exponential development of Internet; major French companies had put into place their strategies for multimedia; a new framework and "rules of the game" had been put in place. He said that in 1996 France was entering a new era during which experiments were beginning to turn some ideas into reality.

M Fillon said that the French Government had taken a pragmatic approach towards the development of the necessary infrastructure and of new services in France. The aims were to try out, in the market, the diverse technological approaches; to evaluate and better understand user needs; and to assess the consumer's willingness to pay for services. Overall, the current experiments, he hoped, would enable France to make good choices for the future. He said that debates would, rightly, still continue about the advantages and disadvantages of cable and satellite, and of microwave transmission and so on. There might be a need for them all, for particular aspects of the information society.

The French Government is keen to familiarise children and young people with the evolving new technology. 700 educational establishments, in 13 regional education authorities, will be provided with connections to Internet by the end of 1996. In addition, secondary schools will be given cut price access to the France Telecom digital network Numéris. Four major Government-funded projects, to develop and use Numéris, will include provision of computers to schools and the development of on-line educational services. (These experiments will be in Bordeaux, Grenoble, Le Mans, and Toulouse.)

M Fillon noted that, by the year 2000, sales of goods via electronic means were expected to reach 20 billion francs (£2.5 billion), and importantly, would create thousands of jobs (in marketing, in the logistics of distance selling, in payment mechanisms, in security aspects and in data exchange). Consequently, the French Government attaches importance to the development of an appropriate cryptography regime, paying full regard to the special requirements of defence and national security. The restrictions currently in place in France are recognised by the Government as being likely to act as a brake on the development here of cryptography and other essential tools for safeguarding confidential data and financial transactions over the network. The French Government have therefore decided to establish a regime of free usage for those whose network transactions need protection and authentification. There will be a system of independent third party organisations ("tiers de confiance") so that users are not required to obtain authorisation for each individual usage. Several third party organisations will be established before the end of 1996 and they will have responsibility for managing and maintaining , in terms of protecting the rights of users, the encryption keys. These changes were included in the telecommunications law passed mid-June 1996.

In terms of ethics and deontology, the French have considered that national justice cannot tackle problems associated with global exchanges of illegal information via Internet and other networks. They will be looking for resolution in European and International fora. The French have already taken some national action to clarify the responsibilities of servers and users. They have placed an obligation on access providers to provide software for their clients which will enable them to block access to certain services, while, at the same time, exonerating their responsibility under the law.

The June 1996 telecommunications law also put in place a new committee to draw up recommendations on controlling material on the Internet. The responsibilities of this high level Telematics Committee (Comité Supérieur de la Télématique) have been extended and the group has been placed under the authority of the Audio-Visual Council (Conseil Supérieur de l'Audiovisuel CSA). The Chairman of the new Telematics Committee will be nominated by the CSA and half of its members will be professionals (access providers, database providers, etc) with the remainder being user and expert representatives. In effect, this is a type of self-regulation.

While the French Government have taken some specific actions to help French industry to seize the opportunities which multimedia offers, the specific actions should be seen in the context of the need to make changes to the overall framework in which industry operates in France. Opening up the telecommunications market to competition is one vital aspect. M Fillon recently said that liberalisation was essential in order to encourage diversity in services and to reduce communications prices. (M Fillon has said publicly that, if France had the tariffs of British Telecom, the average French household phone bill would be reduced by more than 30 per cent.) The decision to abolish the monopoly position of France Telecom from January 1998 was included in a law passed in June 1996.

Dr Monica Darnbrough
Science Counsellor
British Embassy, Paris

June 1996

INFORMATION SUPERHIGHWAYS RESEARCH ACTIVITIES: FRANCE

ANNEX A

1. INRIA (Institut National de Recherche en Informatique et en Automatique) played a leading role in the development of the Internet, and is still active in Internet standards activities. Christian Huitema, INRIA director of research, is currently President of the Internet Architecture Board. INRIA is also the only European partner in the WorldWideWeb.

2. The Institute also operates experimental platforms, partly funded by the EU ACTS programme, partly by the national call for proposals funded by the Ministry of Industry. These are 4:

- Sophia-Antipolis, interactive multi-media services, allowing inter-company communications software and teleactivities to be tested.
- Nancy, a range of generic tools for the development of multi-media information search services with multi-media interactivity (Internet, WWW).
- Rennes, creating the physical infrastructure, software and network necessary for a multimedia date server. WWW services available: wais, gopher, ftp, messaging.
- Rhône-Alpes, access to high performance multimedia server allowing experimentation with high bit rate infrastructure and new network services, eg transformation of large paper documents into electronic form, interactive video, co-operative multimedia document management.

3. Four of INRIA's offshoot companies are also involved: EDELWEB (messaging applications and directories), GRIF S.A. (publishing software), O_2 Technology (object oriented databases) and Simulog (modelling, simulation and optimisation software).

4. INRIA had 25 information superhighways proposals accepted in the recent Industry Ministry tender (including the platforms mentioned in 2 above). These include:

Regional Projects

- STRAP, use of the Internet to promote technology transfer from public research to SMRs in the Ile de France region.
- Praxitèle, information services in the areas of culture, education, training and urban mobility in the town of St Quentin en Yvelines.
- Télé-Médicine, In the Lorraine region: exchange and diffusion of medical images for reference purposes; central server of the Centre d'Imagerie Médicale Européen.
- CNI®, Grenoble Network Initiative: electronic trading and EDI.
- INRIA, Sophia, Antipolis, Sharing of satellite images, with Institut Méditerrannéen de Téléactivités, Club High Tech (Chamber of Commerce), Aérospatiale.
- ImMédiAt, Imagène Médicale à Distance sur ATM telediagnosis in brain surgery, INRIA Rennes with hospitals, industry and France Télécom.
- EDUCAPOLE, Télé-éducation in the Picardy region.

Infrastructure Projects

- Multicable, with Lyonnaise Communications in the Ile-de-France region. To demonstrate the viability of using cable as an IT network and develop a range of services, including Internet connection.

Information Systems Projects

- AQUARELLE, Digital representation of cultural heritage in collaboration with the Culture Ministry and French National Library.

- JOURELEC, Electronic newspaper, aimed mainly at companies.
- LOCOS, French political, economic and social database, in collaboration with Documentation Française (HMSO equivalent).
  Database of grey literature, of political, administrative and technical nature.
- ICONOS, Photography Library Database.

Commercial Projects

Electronic trading, in collaboration with Galeries Lafayette and Compagnie Bancaire. Demonstrator of IT applied to commerce.

Industrial Projects

- Aérospatiale, Development of Internet information service, to diffuse publicly available information of use to Aérospatiale employees.
- SGS-THOMSON, Experiment in data networks; exchange of CAD data files with customers etc.

Science and Technology Section
British Embassy, Paris

June 1996

Letter from the British Embassy, Tokyo

1. I am writing in reply to your letter addressed to Mr Salusbury dated 25 April requesting information on NII in Japan.

2. We obtained the information from Ministry of Posts and Telecommunications (MPT) and Ministry of International Trade and Industry (MITI). The contacts are Ms Makiko Okumura, Deputy-Director for Public Relations, International Affairs Department of MPT and Mr Norihiko Ishiguro, Director for Information, Computer and Machinery and Information Industries Bureau of MITI. Ms Okumura sent us the statistics and phoned Mr Salusbury to explain the other issues. Mr Ishiguro kindly sent us the NII guidelines compiled by the Advanced Information and Telecommunications Society Promotion Headquarters, which I will send you under separate cover (*not printed*).

STATISTICS

3. *PCs*

The saturation level of personal computers in Japanese households is 14.7 per cent as of February this year. It is expected to rise to 21.6 per cent by next year. You may find this level low compared to the USA. However, if we surveyed the total number of ICs per household, Japan would certainly come to the top level. This is because the Japanese tend to have lots of "gadgets" such as TV game consoles, electronic diaries, multi-functional watches, dedicated word processors and so on. Unlike in the USA, most Japanese people still have no idea on how to make full use of a PC other than as a word processor. So they do not feel a need to purchase a PC.

4. *Modems*

We could not obtain the saturation level of modem in households but the ratio of modem users (not holders) among all PC holders is 12.9 per cent. Among all PC and work processor holders, it is 5.1 per cent. and 44 per cent of PCs (including business use) are networked. Modems are still not widely used at home, because taking out a new telephone line costs about £500. So most of the people do not bother to set up a new line exclusively for a modem. And if you share the telephone line with modem communication, the line will end up being constantly busy. This fact puts them off from purchasing modem equipment.

5. *Internet hosts*

The total number of Internet hosts in Japan (as of January 1996) is 269,327. Against world total of 9,472,224, the ratio is 2.84 per cent. The number of Internet hosts per population of 1,000 is 2.2. MPT told us that the biggest reason for the low level in Japan is the language problem. English, the common language on the Internet, is still a barrier for lots of Japanese users. The number of Japanese home pages, services and data bases is not high. The high commission fee (about £140 per year plus initial fee of £50) to be paid to Internet providers and the limited information available in Japanese keeps the number of users quite low. MPT also mentioned that in terms of regulations, there is nothing to hold them back. Any new company simply have to notify MPT of a new service, rather than having to apply for a licence.

ORGANISATION

6. *Rivalry between two Ministries*

The previously mentioned organization, the Advanced Information and Telecommunications Society Promotion Headquarters (AITSPH) is supposed to take a central role in building up the Japanese NII. This was launched in August 1994 and is chaired by the Prime Minister with the participation of all the cabinet Ministers. They have a regular meeting every two months. Both MPT and MITI claimed that none of the rivalry mentioned in your letter[1] exists as they simply follow the principles set by the AITSPH. Therefore, in theory, there is only one body co-ordinating cross-departmental activities for NII in Japan. Of course, in practice, there are often conflicts between MPT's stance as regulators and MITI's role in supporting new industries. I am sure that there are the same conflicts between DTI departments. Moreover, in Japan there are two separate Ministries, so it is much more visible.

Seiko Oya (Ms)
Science and Technology Section

14 May 1996

Memorandum by Butterworths (British and Irish)

INTRODUCTION

The purpose of this submission is to provide the House of Lords Select Committee on Science and Technology (Sub-Committee I—Information Superhighway: Applications in Society) with a publisher's perspective. The submission represents, therefore, the viewpoint of a company with a commitment to provide electronic publishing services to its customers.

Before preparing this submission, the questions listed in the Call for Evidence were discussed with the Clerk. It was agreed that it would be appropriate for Butterworths to address those key issues that were most relevant to the Company as an Information Superhighway information provider. Consequently, the management of Butterworths have identified six areas of opportunity for consideration by Sub-Committee I.

COMPANY BACKGROUND

Butterworths was founded by Henry Butterworth in 1818.

Butterworths British and Irish, together with its sister companies in the United States, Continental Europe and the Far East, is a part of Reed Elsevier plc. It is an established publisher of added value "print on paper" and electronic products and services. The Company provides members of the legal and tax professions with a comprehensive range of reference publications including Halsbury's Statutes, Halsbury's Laws, All England Law Reports, Encyclopaedia of Forms and Precedents and Simon's Taxes.

Butterworths British and Irish publishes a total of 1,000 titles—with 200 new titles issued each year. The Company has over 70,000 customers and services about 250,000 subscriptions per year.

Over recent years, Butterworths has placed increased emphasis on the development of electronic products. Its CD-ROM and Lexis on-line products and services provide customers with a flexible and easy to use complement to traditional "print on paper" products.

STRATEGIC ISSUES

The development of the Information Superhighway is regarded, by the management and staff of Butterworths, as a crucial stage in the evolution of publishing. It represents a step change opportunity to provide customers with added value, timely and accessible information. Understanding and exploiting this technology-led commercial opportunity, however, presents new challenges to both suppliers and users of information services:

Suppliers

- protecting the copyright of owned information.
- adapting the organisation and its processes to accommodate the changing nature of published product offerings encompassing "print on paper", CD-ROM, on-line services and Information Superhighway services.
- establishing pricing mechanisms for Information Superhighway publishing services that ensure sustainable commercial enterprise.
- ensuring that customers have access to quality, packaged, information to meet their specific needs.

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[1] Referring to Q313 in evidence.

Users

- re-engineering business processes and organisation responsibilities to gain commercial advantage from the selective use of "print on paper", CD-ROM and the Information Superhighway.
- establishing new education and training programmes to help users gain a comprehensive understanding of the uses and abuses of the Information Superhighway.

In addition to its potential as a delivery mechanism for publishers, and other media related industries, the Information Superhighway offers a universal solution for world-wide communications. If, however, it is to become more than an electronic mail and marketing infrastructure, the Information Superhighway must offer a profit incentive to prospective information providers and a spend incentive to prospective customers. Without these commercial drivers, the impact of the Information Superhighway on commerce and industry, and its influence on society's values, will be limited.

The management of Butterworths, as representatives of the publishing industry, would like the following observations and opportunities to be considered by the Select Committee.

OBSERVATIONS AND OPPORTUNITIES

1. *The Internet*—As the most credible implementation of the Information Superhighway, the Internet has established a low cost and easy to use infrastructure for developing databases and retrieving information. Its reputation, as a ubiquitous communications and information provider for consumers throughout the world, has ensured its popularity and success.

If the Internet is to become the communications and information infrastructure for industry and the professions it must be capable of delivering high quality commercial information services in a timely and cost effective way. At present the popular success of the Internet has resulted in:

- unacceptable variations in the timeliness of information access/retrieval.
- an unending, and seemingly exponential, growth in the volume of information that may be accessed by consumers.
- an increasing proportion of low quality information that cannot be effectively policed or managed.
- significant variations in the quality of user interfaces for information access/retrieval.

Opportunity—Governments should encourage telecommunications and computer suppliers and information providers to work with Microsoft to establish a second tier infrastructure based on Microsoft Network. The second tier infrastructure would create a high quality, paid for, business information service in addition to the existing low cost, easy access information services (available on The Internet). Providers of business information services would be subject to commercial practice rules (eg the application of copyright and international tax/law regulations, trademarks, commercial ethics) and pay administrative and information management charges. Users of these business information services would pay subscriptions/transaction charges for information access/retrieval.

2. *The value of information*—The Internet has encouraged consumers to regard information as a resource that may be accessed on a low cost or free of charge basis. Whilst the provision of some service information (and information that is of low quality and has little or no added value) will always be available free of charge, those responsible for the marketing of information services on the Information Superhighway must help consumers recognise the commercial cost of managing and enhancing information content.

Opportunity—Governments and publishers should establish education programmes that help users and potential users recognise the value of information and the commercial opportunities of using the Information Superhighway. The education programmes should help users of Information Superhighway services discriminate against those services that offer poor quality information and encourage them to demand access to high quality, added value information to meet their commercial needs.

3. *New products and services*—The Information Superhighway creates new opportunities for communications/computer suppliers and information providers to establish new products and services by:

- creating added value electronic information services through the selective access of published information in other countries;
- delivering mass customisation (providing customers with composite information products that are tailored to meet their specific needs);
- providing customers with subscription or transaction pricing options;
- providing access to the Information Superhighway from both private and public terminals (eg encouraging home working, remote access from hotels and airports).

Opportunity—Governments, telecommunications, software and equipment suppliers and publishers to work together to establish illustrative best practice examples of new products and services (eg establishing best practice, easy to use, "gateways" to the Internet). In particular, participating Governments and companies should offer practical transaction pricing mechanisms for added value services as well as developing innovative, leading edge technology solutions.

4. *Electronic commerce*—The Information Superhighway must be capable of handling financial transactions in a secure and timely way, if it is to become a credible vehicle for business information services. Consequently, the Information Superhighway must accommodate without risk of fraudulent use:

- credit/debit/smart card transactions;
- mechanisms for international electronic cash transactions—taking account of currency exchange and local tax regulations;
- electronic invoicing and automated collection of debts.

Opportunity—Governments, financial institutions, telecommunications and computer suppliers and information providers to work together to develop and demonstrate the effectiveness and security of electronic invoicing/payment transactions. It is crucial that authoritative organisations redefine rules associated with international trading transactions—adopting, for example, new strategies and paradigms for cross-border VAT/tax transactions.

5. *Standards*—Assembling meaningful composite information products, in a timely and "easy to use" way, requires the use of common communications and information standards. Opportunities to establish new products and services are dependent, therefore, upon the willingness of information providers and computer suppliers to work together to establish these common standards. For example, the use of TCP/IP protocols and HTML/SGML data delivery will help ensure portability across databases—irrespective of the nature of the information content.

Opportunity—Governments, telecommunications and computer suppliers and information providers to continue to work with international standards authorities to ensure that the standards encompass the potential needs of Information Superhighway users for (1) speedy access to information and (2) the timely delivery of composite products that offer mass customisation of information.

By developing best practice examples of information, systems, technology and organisation architectures, it will be possible to encourage communications/computer suppliers and information providers to work together to establish a common framework for the next generation Information Superhighway.

6. *User community*—The Information Superhighway has the potential to establish a communications/information infrastructure which would enable users from different professions and different industry sectors to achieve a step change improvement in their ability to understand their chosen markets, their customers' needs and their commercial opportunities. As a *learning system,* it offers users the prospect of a comprehensive and inexhaustible information resource which could be manipulated in an intelligent and selective way—ensuring access to the information needed to make decisions. Without the correct information structures, software search engines and technology infrastructures, however, the Information Superhighway would deliver an *overload* of information which would be incomprehensible.

If the Information Superhighway is to achieve long lasting commercial acceptability to an increasingly broader cross-section of the business community, substantial improvements must be made in:

- the quality, comprehensiveness and structure of available information;
- the quality of information access and retrieval technologies;
- the ease of use and user training.

Opportunity—Governments, communications/computer suppliers and information providers should work together to establish development and training workshops for the business community. In particular, Governments should help industry leaders enhance the vision of the Information Superhighway and set new standards for its effective use.

4 June 1996

Supplementary Memorandum by the Department for Education and Employment

SUPERHIGHWAYS IN EDUCATION AND TRAINING

1. The Committee sought additional information on the likely impact of the information superhighway on working practices and employment prospects. In advance of superhighway technology becoming widely available, estimates of the impact must at this stage be largely speculation. In general it can be expected that, as in other fields, this new phase of technology will increase the speed, range and quality of communication, and particularly the degree of interactivity involved in the provision of services.

2. This can be expected to lead to such developments as:

- increased global competition in information based services and falling communication costs;
- the opening of new markets, for example in tele-shopping and tele-banking;
- more remote working, which might particularly favour regional locations for companies;
- different styles of working, such as working from home on a flexible hours basis;
- a demand for new skills based on IT capability and network literacy.

3. Current evidence does not at present suggest that the progressive introduction of new technology will result in fewer jobs overall in the UK. New technology is itself an expanding sector of the economy with the scope for substantial job creation. To ignore new technology, including the development of information networks, would be to risk losing business to more efficient competitors. The main impetus for the introduction of new technology within established industries is to increase productivity and reduce costs, and offer new services. It is therefore essential to the competitiveness of British industry. New technologies may also improve the employment opportunities for groups (such as the disabled and those with special domestic responsibilities) who otherwise have difficulty in participating fully in the labour market.

4. A significant effect of new information technology has been to enhance the development of flexible forms of working. For example, "teleworking" involves people working away from the business premises, at home or in a remote office, through a computer link. Research by the Department shows that many firms—one in 20—already make some use of telework.

5. Government responsibility lies via its overall education and training policies in helping individuals, particularly young people and the unemployed, to acquire the skills required fully to utilise new technology. In this context lifelong learning for individuals will take on increased significance to reflect the updating of skills and knowledge necessary to keep abreast of rapid technological change.

SUPERHIGHWAYS AND TRAINING

6. Successful use of new technology in training will only result from a careful analysis of the learning need, an understanding of where the technology is appropriate and where it is not, and a recognition of the importance of human support for learners. Development projects by the Department and others have shown how technology-based training can provide high quality learning, accessible at a time and place to suit the learner or the employer. New technology can also, through enhanced simulation technologies, offer a quality and range of training which is unachievable by conventional methods.

7. Recognising this potential, the DfEE announced last year a new Innovation in Training Initiative designed to encourage and help employers and others to exploit to best effect technology-based and other flexible learning methods. The Initiative will help Training and Enterprise Councils (TECs) in particular to develop flexible learning methods based on the newest technologies in their own programmes and to establish local access to advice and information on such methods, especially for small firms. Learning strategies will be developed through which TECs can influence training practices in their areas. The work will focus on:

- a programme of workshops for TECs, to help staff and agents of each TEC develop a business plan for the use and promotion of flexible learning;
- support for implementation of such plans.

8. Also as part of the Initiative a learning technology advisory service is being established to:

- monitor research and developments in training technologies, including broadband telecommunications, and assess their value in relation to key training issues eg, cost effectiveness, competence, core skills and take up of National Vocational Qualifications (NVQs);
- ensure that existing sources of advice and information to employers (TECs, business links, Chambers of Commerce, Industry Training Organisations (ITOs), employers' federations etc) are kept informed of the outcomes of this assessment;
- help forge links between specialist expertise and existing sources of advice and information;
- help others to design and devise trainer training programmes in technology;
- advise producers and suppliers on quality issues in technology-based training.

FUNDING OF THE IT INFRASTRUCTURE IN SCHOOLS

9. The Committee also sought updated information on access arrangements by schools to high speed networks, as these are progressively introduced. The Committee drew particular attention to public comment on the recent consultation exercise by OFTEL on the future provision of universal service and its implications for schools.

10. Clearly the circumstances under which schools (and other educational institutions) have access to new high speed networks raise financial and other issues of policy interest to several departments as well as the DfEE (for example the DTI is responsible for regulatory issues within the national telecommunications infrastructure). In relation to OFTEL's current consideration, their consultation showed support for access by educational institutions at reasonable cost. However there was not consensus on how this might best be structured, having regard also to the regime envisaged in the draft European Council Directive on interconnection in telecommunications. In the circumstances OFTEL are now considering new proposals addressing the needs of schools and other education institutions, separate from the wider questions involved in universal service generally, and will in due course announce further details for discussion with the telecommunications industry and other interested parties. The Committee will be kept informed as appropriate.

Further Supplementary Memorandum by the Department for Education and Employment

EMPLOYMENT IMPACTS OF SUPERHIGHWAY TECHNOLOGY: FORWARD PROSPECTS

1. As the Department's earlier Supplementary Memorandum for the Sub-Committee indicated, superhighway technology has not yet been introduced to any significant extent in the UK. As yet, its impact on employment has yet to materialise, and the effects of broadband technology as such (and separate from the wider effects of new technologies in general) cannot be predicted with any accuracy or reliability.

2. Attention was drawn, in the earlier Supplementary Memorandum, to the likely effects of the new services and opportunities likely to become available as broadband technology expands. It may now assist the Sub-Committee to receive some further information on the impact that the development and implementation of new technologies in general have had on employment prospects and working practices. Such information, based on formal studies, may usefully illuminate speculation on the future effects of intermediate and broadband transmission networks.

3. Generally, current evidence does not suggest that the progressive introduction of new technology will result in fewer jobs overall in the UK. At the level of an individual firm it may be possible to see job losses associated with new technology, as work becomes less labour intensive, but it should not be assumed that this has a similar effect on the total demand for labour. While jobs are lost in some areas, elsewhere in the economy technological change leads to the emergence of new jobs, requiring new skills in producing new products.

4. New technology is itself an expanding sector of the economy with the scope for substantial job creation. In established industries, the impetus for the introduction of new technology is to improve productivity and reduce costs, and offer new or better services. If the result is that prices fall and output expands, the effect on employment may be positive. It depends on how responsive demand is to changes in prices, and how responsive employment is to changes in output.

5. This is supported by evidence which shows that over time, rising output, employment and productivity (the last brought about by technological improvements) have generally gone hand in hand. In their 1994 Jobs Study the OECD conclude that "Technology is central to the process of growth and employment creation; it is what allows increases in productivity and real incomes. History . . . provides many instances where subsequent developments have confounded predictions of an emergence of large scale technological unemployment. While some unemployment has always accompanied the introduction of new technology, the additional jobs created directly and indirectly have been sufficient not only to replace those lost but also to expand employment substantially."

6. Other studies to consider the impact of new technologies include "Workplace Industrial Relations and Technological Change"[2] and "Employment Effects of New Technology in Manufacturing"[3]. The first study was based on the DE/ESRC/PSI/ACAS surveys and examined the use and introduction of new technology across all sectors of the economy. The author did not consider that new technology in itself was responsible for large-scale reductions in the workforce. ". . . the introduction of new technology played a very small part in the overall pattern of manpower reductions. Generally, where workplaces were forced to reduce their complements, it was as a result of loss of demand for goods or services, or because of cash-limits or cost reduction exercises or reorganisations. . . . [Managers] cited the introduction of new technology as a contributory factor in only 10 per cent of cases." The author goes on to state "there was no doubt from our findings that the introduction and use of new technology has more implications for the nature, than for the number of people employed." The study found that workplaces using advanced technology were much more likely to recruit more skilled workers, both in manual workplaces and in offices.

7. "*Employment Effects of New Technology in Manufacturing*" considered the effects of the micro-electronics revolution over ten years. It came to the conclusion that new technologies present less of a threat to jobs and skills than was feared in the 1970s and early 1980s. Although considering the impact of new technologies in manufacturing plants rather than across the economy as a whole, it may be useful to note that it reinforces the conclusions above: "The decreases in employment were *smaller* in the factories using micro-electronics that those with no application; *smaller* in the larger plants than among the small and medium sized users; *smaller* in the high-use industries that in the low-use ones; and *smaller* in the plants with the more sophisticated kinds of applications and equipment."

8. This study also considered the impact of new technology on the nature of jobs as well as the overall numbers employed. ". . . New technology was thought by several respondents to be a prime factor in encouraging the development of 'multi-skilling' or flexibility in skills."

9. While the longer term effect of technological change is to increase productivity and the wealth creating potential of the economy, the Government does not underestimate that technological change may contribute to structural unemployment in the short-term, particularly if the skills possessed by those employed in declining industries differ from those required by employers in new and expanding industries.

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[2] *Workplace Industrial Relations and Technical Change* by W. W. Daniel (1987); Frances Pinter (Publishers) Ltd in association with The Policy Studies Institute.

[3] *Employment Effects of New Technology in Manufacturing* by Ian Christie, Jim Northcot and Annette Walling (1990); The Policy Studies Institute.

10. In the light of these various expectations, Government policies are geared towards creating a flexible, competitive economy that is open to, and able to adapt to, technological change in order to secure higher levels of employment. The recently published Competitiveness White Paper[4] highlighted the Government's commitment to explore and drive forward new developments, underlining that new technology is central to maintaining competitiveness.

Supplementary memorandum by the Department of Health

ELECTRONIC PATIENT RECORDS

The Department is currently in negotiation with the medical profession on the mechanisms and safeguards required to establish electronic patient records. A statement on the likely timescale is anticipated in the near future.

ARTICLE IN THE *New Scientist*

Without the context of any background, the article in the *New Scientist* (20 April 1996) would appear misleading.

Background

Almost every acute and community trust in the NHS has, for some time, been using networks which in the main have no security defence mechanisms at all. During the development of the requirements for NHS-wide networking, a project was established to examine specifically networking security issues. The profession was fully represented in both the project management and quality assurance arrangements of the Networking Security Project which ran from April 1994 to March 1995. The project resulted in a series of recommendations which are more demanding than those applied to most commercially available networks, for example:

(i) Using electronic signatures for strong personal authentication.

(ii) A Code of Connection that has to be authorised at Chief Executive level, and which demands that existing (legacy) network connections are stringently audited for security purposes.

(iii) Network filtering, to ensure that only those network users who have been authorised are permitted access to predefined parts of the network. Similarly, closed user groups, caller line identity and dial back technologies.

Encryption

However, the Department has not been deaf to the BMA's representations about data encryption. A study was commissioned towards the end of 1995 to examine the practicalities and cost of establishing a comprehensive system for encrypting NHS data. Following that study, Ministers decided that the recommended "Red Pike" encryption device would need to be evaluated and trialled before making any commitment to spend substantial sums of public money.

It should be noted that a local encryption capability is available now but cannot be scaled up to support a national service such as that required by the NHS.

Further supplementary memorandum by the Department of Health

Thank you for your letter of 21 May.

As requested, I attach an update on the Department's position on electronic patient records which I hope the Sub-Committee find useful.

Please contact me if you require anything further.

Ieuan Jones
Parliamentary Branch

18 June 1996.

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[4] *Competitiveness: Creating the enterprise centre of Europe* (1996) HMSO.

BRIEFING ON ELECTRONIC PATIENT RECORDS

Background

For more than twenty years, clinicians, information technology specialists, software writers and computer suppliers have all tried unsuccessfully to produce an acceptable and effective electronic patient record system. A recent article in a journal of medical informatics suggested that solving all the problems of electronic patient records should be one of the "grand challenges" for medical informatics in this decade.

The Audit Commission report "Setting the Record Straight" in 1995 drew attention to the unsatisfactory state of the paper record—many records are poorly legible, ill-structured, bulky and untidy and relevant information cannot be found because of the volume of disordered paper; the records occupy an inordinate amount of space and the logistics of managing the record library are complex and difficult; the record itself can only be in one place at a time and often cannot easily be found; as a result, some clinics or wards distant from the main library, some disciplines like physiotherapy or nursing, some specialties like maternity or psychiatry have their own record library so that clinical information can be fragmented and scattered over the hospital or practice.

Recent developments

Document imaging is a recent attempt, mentioned by the Audit Commission report, to reproduce the whole paper record electronically. In fact many people believe wrongly that document imaging is synonymous with electronic patient records. In this approach, the pages of the paper record are scanned into the computer to create a series of images which are stored on optical discs which are capable of holding massive amounts of information. The technology is very like fax and is, in concept, like microfilming of records. It solves the problems of storage space; the record is never lost as long as the system is running; unlike microfilming, the record is easily accessible and the record can be shared by different people at different places at the same time. However it is still a paper-based technology: the records are no more legible or well-structured than in paper systems, the problems of information overload in paper files is carried over into the computer; information held as images can be analyzed for management or audit no more easily than it could be on paper. In addition, imaged files are larger than the equivalent computer text file by a factor of 10. This can have a major impact on the performance of networks especially at peak times and is bound to stretch storage facilities over time due to the high volume of transactions. While there is a niche for document imaging and while it can solve some immediate problems for some trusts, the way in which document imaging is currently implemented is not seen as a long term solution for electronic patient records.

Most early work in the development of a computer clinical record was aimed at recreating the complete paper record on the computer but in computer text rather than as image. This gave rise to serious problems: for example, the methods of entering clinical information into the computer needed skills that few clinicians possessed, the database technology then available was not well suited to handling text in the way that clinicians needed and the use of static, office based terminals imposed a style of practice that was unacceptable to most clinicians working at the bedside in the ward. Technological innovation in the 1990's has given the potential to resolve these problems.

Departmental Initiative

In 1994 the Department of Health NHS Executive Information Management Group set up the Electronic Patient Record Programme as a three year research and development programme to explore the issues around electronic patient records. Its goal is to help clinicians in acute hospitals give better care to patients through the use of electronic patient records. After a number of preliminary studies, the following principles were established:

(a) the task was to provide doctors, nurses and other health care professionals with the information about patients that they needed to do their job, not simply to recreate the paper record on the computer to give a "paperless record."

(b) the record was recognised not to be a single entity but to be a collection of messages created by different people for different purposes about different activities held together only because they related to a single individual. It was realized that there was no need to computerise the whole record at a single stroke and that it could develop step by step over time.

(c) the aim of medical record is not to store the record in a library but to communicate and make available information about past care and future plans relating to individual patients. Recognition of this sharing meant that electronic patient record systems should be institution-wide rather than limited to departments since clinicians should be able to use the system wherever they are in the institution.

(d) the purpose of the system should be to enable the clinician to do their job and the record should be produced as a by-product of clinical activity. For example, the system should allow the clinician to request a test or prescribe a drug at the bedside. This information would be transferred immediately to the laboratory or pharmacy for action and at the same time a record of the clinical activity would be created. Because of this operational requirement, clinicians need to be able to use the system at the bedside or in the clinic when they are caring for patients.

(e) maximum benefit from computer systems comes from not just making available the medical record but from linking clinical activity on the computer to alerts and warnings of potential problems and to guidance about best practice.

(f) the information needed for management and audit should not be created separately but should be derived from these clinical systems.

Two NHS trusts—Burton Hospitals NHS Trust and Wirral Hospital NHS Trust—have used these principles to develop systems which show the concepts of electronic patient records in action. Progress on the sites suggests that the development of information systems to support clinicans operationally, while creating and storing an electronic patient record, is an achievable objective. Further detailed information about progress at these demonstrator sites is available if required.

The Information Superhighway and Electronic Patient Records

It has been pointed out that we now have all the technology to enable electronic patient record systems to be developed within institutions and they are likely to be commonplace over the next three to five years. Sharing patient information between institutions is much more complex and more work is needed before this can be achieved. Critical areas include:

- Nation-wide patient identifiers: Unique Patient Numbers
- Data definitions including clinical terms
- Hardware and software compatibility
- Communication formats and protocols
- Confidentiality, legal issues and definition and control of user access rights.

The NHS Executive Information Management Group has groups working in each of these areas and it is possible that secure, shared multimedia patient records will constitute a major traffic on the information superhighway within the next seven to 10 years.

THE SOCIAL IMPACT OF ELECTRONIC PATIENT RECORDS

It must be expected that the introduction of electronic patient records will have a major impact on organisational and institutional structures within health care organisations and on the way that health care is delivered. Electronic patient record systems cannot be seen as optional add-ons to embellish care and to please some clinicians, but they must be recognised as an essential technology to achieve the objectives of the clinicians and the wider goals of the NHS. Further research and development will be necessary to explore these issues.

Letter from the Department of Health

Thank you for your further letter of 19 June.

The Department of Health is in consultation with GPs' national representatives with a view to legitimising computerised GP patient records. We are not yet in a position to say when the necessary changes to GPs' terms of service might be introduced.

I hope this is helpful.

I Jones
Parliamentary Branch

21 June 1996

Memorandum by the Department of National Heritage

Executive summary

The Department of National Heritage, through its sponsored bodies, has the care of a great amount of cultural property. Superhighways are, and will increasingly be, an important means of delivering information about, or images of, this property to the public. Libraries, museums and galleries are, in particular, well-placed to play a major role in this communications revolution. Competition between different means of delivery can improve the quality and availability of the information, and reduce costs to the consumer. This is one of the aims of the Broadcasting Bill now going through Parliament. At the same time, owners of cultural and intellectual property should be able to command a fair return for making their collections available through the various media which comprise the information superhighway.

MEMORANDUM

The Department of National Heritage (DNH) has responsibility within Government for the arts, museums and galleries, libraries, heritage, film, licensing the export of works of art, sport, tourism, press regulation, broadcasting and the National Lottery. Through the Non-Departmental Public Bodies (NDPBs), Public Corporations and Advisory Bodies which it sponsors it spends £1 billion of public money. These sectors represent activity worth £50 billion pa, about 10 per cent of the Gross National Product.

2. The Department therefore has, directly and indirectly, the care of an enormous amount of information and cultural property. Making all this accessible to the public is one of the Department's main concerns, both to extend the public's choice and to contribute towards national prosperity and prestige. In addition, through its responsibility for regulation of broadcasting, and its watching brief for press regulation, DNH has an interest in public policy questions raised by new media of disseminating information and entertainment.

3. The "information society" has the potential to transform the quality of life in a way that has, perhaps with some exaggeration, been compared with the invention of printing. The rewards are enormous: as noted by the G7 Ministerial Conference on the Information Society, they could include better social integration; the recovery of a sense of community; enhancing the progress of democracy; as well as preserving cultural creativity, traditions and identities; improving the quality of life; stimulating economic growth, job creation and economic efficiency; a better balance in economic and social progress between nations; a smoother integration of developing countries into the global economy; and the development of a capacity to solve common societal problems.

4. DNH's main interest is in content, that is the message (data, information, interpretation, entertainment) which is transmitted on the superhighway. Hardware (equipment and networks) and software (computer programmes) are more a matter for DTI and have been covered in that Department's memorandum to the Committee.

5. The United Kingdom's sources of information, databases and cultural property are of great importance. The Committee will remember, from the DTI Memorandum, the estimate that information content represents 48 per cent of the overall value-added of IT, compared with 38 per cent for distribution and 14 per cent for hardware and software.

6. DNH is determined that information should be as widely available as is compatible with allowing providers of content and services to make a reasonable return for investment. This is a time of great opportunity, helped by the fact that English is increasingly the language of the international communication, but there are also dangers of being left behind. For example, the UK starts with many advantages in the field of educational materials, but may be losing the initiative to the United States.

7. The rest of this Memorandum responds to those of the Committee's questions which are of concern to DNH.

1. WHAT IS THE FORM OF THE "INFORMATION SUPERHIGHWAY", AND HOW IS IT DEVELOPING (I) IN THE UNITED KINGDOM AND (II) WORLDWIDE? WHAT SPECIFIC PROBLEMS ARISE FROM INCOMPATIBLE NETWORK STANDARDS AND WHY ARE THESE INCOMPATIBILITIES ARISING?

8. This question has been addressed by the DTI's memorandum. DNH would like to stress that while compatibility of different means of information delivery is clearly important, the Government wishes to ensure that they can compete with each other in order to increase quality and choice of material received, and reduce costs to the consumer. These aims inform the Broadcasting Bill, now making its passage through Parliament, which introduces a framework for the development of digital terrestrial broadcasting, and liberalises the existing rules on media ownership (enabling United Kingdom companies to compete more effectively and invest more in new technology, including digital broadcasting).

2. WHAT SERVICES ARE BEING PROVIDED AND (SHOULD BE DEVELOPED/WILL BE REQUIRED) WITHIN, FOR EXAMPLE, THE FOLLOWING AREAS: (I) PUBLIC INFORMATION, (II) COMMERCE, (IV) EDUCATION AND (VIII) ENTERTAINMENT?

9. The DNH provides information on its own activities to the World Wide Web via the CCTA Government Information Service, and directly via its own Internet server. The Department's electronic address on the World Wide Web is http://www.heritage.gov.uk.

10. As part of a series of policy reviews currently under way, the Department is considering the application of IT in public libraries, museums and galleries, and the arts.

Libraries

11. The British Library is at the forefront of document and data transmission to public, national, academic and private sector libraries. Millions of records describing items in its collection are on-line. Rare and fragile documents can be digitised and made accessible; a facsimile of the unique manuscript of *Beowulf* is on-line. Public libraries, which are used by 24 million adults, are increasingly accessing computer databases through

the PSTN and Internet. The British Library and public libraries are developing links with the higher academic network, JANET.

12. Croydon Public Library is putting a register of several thousand companies in the Borough on the Internet, and Solihull Public Library has established an IT point with its own server, allowing access to the Internet and World Wide Web. A growing number of libraries are also becoming information providers through EARL, a consortium of public libraries developing services over the Internet, or through their own local authority servers. The idea of libraries forming the focus for public access to superhighways is gaining currency, some libraries already providing public access to the Internet. The Department and the Library and Information Commission are investigating how best to encourage this access within the framework of a coherent IT strategy for libraries. The involvement and engagement of the private sector in this process will be critical.

13. The British Library provides many services using information technology, including its Science Reference and Information service, which has made its catalogue available on the Internet and undertakes a wide range of online database searching for business and other users. It has recently launched the Health Care Information Service, providing health care professionals with direct access to bibliographic databases and undertaking online database searching.

14. A growing number of public libraries are becoming linked by technology to Business Links. Hertfordshire County Library has e-mail links with Hertfordshire Business Link and provides wide access to its catalogue via the Internet. The six Cheshire Business Links have computer access to an index and abstracts of the reference stock and organisations database of Cheshire County Libraries Business Information service: this service has video-conferencing facilities and has a presence on the Internet through which it is picking up and answering enquiries.

15. Public libraries are a major source of information about businesses and about leisure pursuits, including tourism, sport and entertainment. Much of this will be available on the Internet, or other public networks, making it more up to date. They can also play an important part in supporting and complementing education, training and life-long study, and in acting as a shop-window for IT products.

Museums and galleries

16. Museums and galleries can use IT:

- to advance the care, management and use of collections;
- to enhance the experience of visitors to museums, as well as specialist users; and
- to promote their services and expand curatorial, scholarly, public and commercial access to their collections and resources.

As "content-rich" institutions, museums are well placed to exploit the possibilities of superhighways and take part in the developing new technology. The Museum Documentation Association (MDA), which is funded by the Department, develops standards for museums, advises them on the implications of the new information technologies, including developments in superhighways. The Department has recently made additional funding available to the MDA to enable it to carry out a special investigation into IT and museums to be completed in 1996–97.

17. The LASSI (Larger Scale Systems Initiative) project is a consortium of museums, supported by the Museums and Galleries Commission (MGC) which was formed to develop a new computerised collections management system. LASSI is intended for use in medium-sized and larger museums and is unique in combining resources of national and non-national museums and galleries in a common project. Consortium members are the Tate Gallery, the Imperial War Museum, the National Maritime Museum, the Horniman Museum, Hull City Museums, the National Museums and Galleries on Merseyside, Leicester Museums, Nottingham Museums, and the MGC. The Department has paid £30,000 towards the specification phase of the project.

18. The Natural History Museum and the Science Museum have sites on the World Wide Web, and the National Gallery has a "MicroGallery" computer information room. The Wellcome Museum of Egyptian Antiquities in Swansea has a site on the Web. Over 20,000 enquiries are made each week from people around the world, mostly from the UK and North America. Information is provided about the nature of displays, opening times and publications, and a series of objects in the collection are presented. Tullie House Museum and Art Gallery in Carlisle is a good example of a smaller local authority institution which has pioneered multimedia applications: its package, called frontier 2000, has a tape, a video and a CD-ROM, and is accessible on a local network.

19. Scottish Cultural Resources Access Network (SCRAN 2000) is the first recipient of an IT award (£7.5 million) from the Millennium Commission. It is a joint project by the Scottish Museums Council, National Museums of Scotland and the Royal Commission on the Ancient and Historical Monuments of Scotland. It involves digitising about 8 million items and 10,000 images from over 200 Scottish museums and institutions and will be widely accessible to schools and libraries in Scotland.

20. New technologies, including superhighways and multimedia, offer enhanced opportunities for public enjoyment of artistic achievements and the heritage. They provide scope for museums and galleries to enhance public access to their collections by presenting information in different ways and making it available on-line.

21. Education is mainly a matter for DfEE, whose Superhighways in Education papers have covered the subject extensively. The DTI's Schools On-Line project aims to look at the scope for the use of multimedia and the Internet in schools. Links between libraries, museums and schools will improve, as will those with higher education and possibly research institutions. Distance tutorials and video-conferencing will build on experience in open and distance learning, greatly enhancing public library support for lifetime learning. Eventually, there will be links between the library and the home.

The Arts

22. The Arts Council's Internet site is still at the planning stage, but they expect it to be available during this year. It is expected to provide an introduction to the work of the Council, together with information on development funds available, press releases, and job opportunities. There will be extensive links to related sites. The 10 English regional Arts Boards have a joint Internet site giving information on each region on a similar basis to that planned for the Arts Council.

23. The Crafts Council's Internet site will go on-line on 1 April 1996. It will intially consist of around 40 pages of information about Council activities. They hope to develop a second stage within a year, putting on-line some of the services now offered from their headquarters. This could include back issues of magazines, a makers' register and mail order selling. The Council "Photostore" project, based on CD-ROM, is currently available only at the Council's gallery, but it is intended to be operable at remote sites later this year. The decision has yet to be taken as to whether these will be stand-alone or networked.

Heritage

24. English Heritage (EH) has a site on the Internet with geophysical information on its archaeological work. It is considering a new site with information on all its activities and publications. The Royal Commission on Historical Monuments of England (RCHME) has about 100 pages on the Internet about its activities and publications, with a sample from the National Monuments Register. EH and the RCHME are looking at ways of exploiting commercial possibilities.

25. The Royal Parks Agency are on the Internet. They have an eight-page entry listing each park and the services provided. Their Corporate Plan and Annual Report are available on the Internet.

Sport

26. The Sports Council is involved with the UK Sports Information Consortium in considering how the Internet can be better structured to provide information about sports activities and services. This is not an issue on the immediate agenda, given other competing priorities, but will be addressed when the restructuring of the Sports Council has been implemented and settled down. The Sports Council has no reason to believe that it cannot meet the technical challenge. It is also aware that much information is already available on the Internet but this is unstructured, since individual sporting activities or clubs put information on the system as they please. This makes searching for information difficult.

27. The Department is also aware that Hercules Comms manage the Internet site of all Premier League football clubs (called CARLING NET). Hercules sells merchandise on behalf of 13 of the 20 clubs. The services they provide are half-time and full-time match reports, and club player profiles (with about 650 photographs). A contract with the Press Association enables them to provide material for up-to-the-minute news releases. Live World Club cricket results are also available on the Web.

Tourism

28. The British Tourist Authority (BTA)/English Tourist Board's site is due to go live at the end of March. It will provide an "anchor" for existing and proposed National/Regional Tourist Board sites as well as being an aid to marketing and assessing business potential and a reference tool highlighting additional sources of information. Superhighways are an easy and relatively cheap way of targeting consumers directly, and an ideal way of sharing information with BTA's offices overseas.

29. BTA also has an on-line magazine "Travel Britain Online", which gives visitor information and BTA press office stories. Two BTA offices are able to offer a brochure-ordering service. A review is currently under way on how to increase access to British Tourism products, and improve bookings. This will be completed shortly, but early indications are that the Internet or other on-line network will play an important part as a central hub for information allowing Electronic Data Interchange (EDI) type connections to local reservations systems.

Broadcasters

30. Many broadcasters are exploring new opportunities and markets in relation to multimedia, video and audio on demand, and interactive television. BT, Cambridge Cable and others are involved in pilot video-on-demand systems. Two Way Television has agreements with some broadcasters to pilot an interactive television system. BBC television programmes maintain more than 20 Internet sites.

3. WHO WILL SUPPLY THESE SERVICES TO CONSUMERS IN THE UNITED KINGDOM? HOW CAN THE PARTICIPATING COMPANIES BE CATEGORISED AND WHAT IS THE NATURE OF THE COMMERCIAL RELATIONSHIPS BETWEEN THEM? HOW ARE SUPPLIERS LIKELY TO DEVELOP? WHAT SERVICE STANDARDS EXIST AND HOW ARE THEY LIKELY TO EVOLVE?

31. DNH is concerned both to ensure universal access to the collections it sponsors, and to protect intellectual property rights. This requires a careful balance to be made.

4. HOW CAN UNIVERSAL ACCESS TO SERVICES PROVIDED FOR THE COMMON GOOD BE SECURED WITHIN A COMMERCIALLY COMPETITIVE MARKET FRAMEWORK?

32. Supply of hardware and delivery systems are for DTI. Access to content is a matter for the organisation which holds the intellectual property rights.

5. WHAT IS THE ROLE OF CENTRAL GOVERNMENT IN CONNECTION WITH THE "INFORMATION SUPERHIGHWAY" SERVICE PROVISION, INCLUDING THE FOLLOWING AREAS?

(i) *Leadership*

33. DNH sees its main role as supporting Government policy encouraging the development of the superhighway. DNH is keen for bodies in the sectors it sponsors to take full advantage of the opportunities offered by superhighways. As already mentioned, the Department funds the Museum Documentation Association which advises museums about the implications of IT and the superhighway, and the Library and Information Commission which aims to co-ordinate the growth of superhighways connected to libraries. The Department also funds developmental library projects, through the Public Library Development Incentive Scheme.

(ii) *Security of payment*

34. This is dealt with in DTI's Memorandum to the Committee.

(iii) *Data protection, confidentiality and censorship*

35. DNH's main locus in the control of content arises from its interest in the application of the general law to broadcasters and the press, and its desire to disseminate but protect intellectual property in the various collections in the sectors which it sponsors, and its responsibility for Government policy on broadcasting regulation. The DTI Memorandum deals with Government policy on the first two points.

Regulation

36. Regulation of superhighways is for DTI, as an aspect of their responsibility for telecommunications policy. There is however no clear-cut boundary between telecommunications and broadcasting, and it is possible, for example, that the licensing responsibilities discharged by the Independent Television Commission under the Broadcasting Act 1990 may, in some circumstances, cover content carried on the superhighways, particularly where it includes moving images. It is questionable whether ITC licensing would be regarded as an appropriate solution to any problem perceived to attach to the content of superhighway services, and the legislative position will need to be reviewed as services develop and the regulatory needs and responses become clearer.

(iv) *verification of information; and*

(v) *promoting the development of UK-oriented software*

37. These are matters in which DTI leads, but museums, for example, have a particular interest as they are concerned about the intellectual property rights in their valuable collections.

6. WHAT IS THE ROLE OF LOCAL AND REGIONAL GOVERNMENT IN CONNECTION WITH THE "INFORMATION SUPERHIGHWAY"? HOW CAN NEW SERVICES BE USED TO BOOST (A) THE ONGOING REGENERATION OF URBAN AREAS, (B) OTHER LOCAL ECONOMIES?

38. Local Government, a as provider of public libraries, museums and schools can play an important role in the development of superhighway services. Museums, in turn, play an important part in supporting local tourism which nationally is worth £33 billion a year. Use of the superhighway can help to generate tourist revenue. Many authorities are developing their own public information networks which could be linked to the Internet.

7. WHAT WILL BE THE IMPACT OF THE "INFORMATION SUPERHIGHWAY" ON WORKING PRACTICES AND EMPLOYMENT PROSPECTS?

39. The Department for Education and Employment takes the lead. There will be demand for new broadcasting and editing technologies. The new technology may squeeze the printed press, with more people able to do desk-top publishing, and access books and databases on the superhighway. New film techniques like perfectly synchronised dubbing, digitally produced film (with sharper images), and computer-generated images (as in Jurassic Park) create a demand for new skills. New commercial and management skills will be needed.

40. Public libraries are key players in providing "open learning" services for life-long learners, and will play an increasingly important role in providing computer-based interactive learning packages for retaining and reskilling the workforce; in providing facilities for distance tutorials and video-conferencing; and in delivering resources and information for continuing professional development.

41. In libraries, museums, and galleries, work such as documentation, public information services, collection management, display and publication will increasingly be managed electronically.

42. As an increasing proportion of the population leaves active employment and comes to retirement, many of whom have already adapted to the new technologies, there will be a growing demand for the new services offered by libraries, museums and galleries.

17 April 1996

Memorandum by Free Computers for Education

1. We are the organisers of the Educational Management Exhibition. My Chairman, Brian Lee, is determined that this company shall put something back into education. One of the projects that we are undertaking is a scheme that will put thousands of free computers into educational establishments up and down the country. This will go some way towards countering the disgraceful fact that, for example, the average secondary student spends less than thirty minutes per week on his or her school's computers.

The following Appendices[5] are attached:

(1) A press release concerning the Free Computers For Education Scheme (hereinafter referred to as "the Scheme").

(2) The Scheme's Articles of Association.

(3) The Scheme's Area Committees' terms of reference.

(4) A table summarising the application forms received by the Scheme during the dry run in Tower Hamlets.

(5) A file of press cuttings concerning the Scheme.

(6) A schedule of radio and television interviews concerning the Scheme.

(7) A tape of a radio interview concerning the Scheme conducted by the writer with BBC Southern Counties Radio on 24 April 1996.

(8) An article summarising intended European legislation concerning the recycling of computers and other equipment.

2. There is hugh amount of valuable curriculum material available on diskette, CD-ROM, the Internet, and on interactive video. There are also enormous educational possibilities in video conferencing. Another

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[5] Appendices 2-8 are not printed in this volume.

largely untapped area that carries great educational potential is co-operation in projects with educational establishments overseas. These resources are all available now and will continue to be available.

3. The bottleneck is the hardware. Prices thereof have come down dramatically, especially for equipment that is not state-of-the-art, such as the 386 or the 486, but even adequate provision of computers is still beyond the means of most schools.

4. Obviously the Government must take into account many different calls on its purse, but, without wishing to be melodramatic, this country is on the verge of producing a seriously disadvantaged generation. Computers will play such an important part in the future lives, working and domestic, of those currently in the education system that somebody must do something immediately. Without pointing the finger of blame at anybody in particular the powers that be are simply not grabbing the problem by the scruff of the neck, so we are.

This is similar, as we understand it, to the attitude of Don Cruickshank, Director General of OFTEL. Over the past year he has given interviews rightly saying that, if others will not do something about the information superhighway in education, he will, at least on the telecommunications front. We attended an OFTEL symposium on the subject earlier this year—no doubt you have seen the papers relating thereto.

While the provision of hardware is not within OFTEL's brief, his views and ours mesh neatly—he sees the need for an immediate and practical initiative to be taken on the telecoms side, and we see the same on the hardware side.

5. We have had discussions with the DfEE. We understand that their view is that the only machines worth putting into educational establishments are high-powered multimedia computers. In an ideal world this would of course be the case. While there is undoubtedly a need for such machines, financial practicalities mean that it is wholly unreal to confine one's efforts thereto:

- (i) As a matter of simple economics the most up to date machine's are extremely expensive. By the time they become less expensive they are no longer up to date.
- (ii) The use of I.T. is mandatory in core curriculum subjects.
- (iii) Much educational software will run on slightly older machines.
- (iv) Educational establishments' budgets are so tight that that most of them simply cannot afford the luxury of the most modern technology.

Our submission is not aimed at changing Government policy on educational financing—rather it is aimed at a more efficient use of existing resources.

6. The Scheme is quite simple, and is based on the fact that medium to large organisations graduate to a new generation of computers about every 30 months. The "old" computers, thousands of 286, 386 and even 486 machines, are currently being thrown into skips or onto landfill sites, yet are perfectly usable in educational establishments.

There are three main limbs to the Scheme:

- (i) The medium to large organisations are being persuaded to donate their outgoing computers to the Scheme.
- (ii) A nation-wide network of Area Committees, comprising representatives from bodies such as the National Association of Head Teachers, the National Federation of Parent-teacher Associations, the Rotary Clubs of Great Britain, the Royal British Legion and local businesses, will decide which establishments in their area will get what computers.
- (iii) The Area Committees will organise the collection of the computers, their checking, and delivery to the recipient educational establishments. To put it shortly the Scheme relies on a small amount of effort from a large number of people. We have closely examined the logistics of this part of the Scheme and it is obvious that, given the support of the organisations named above, it will work.

We have concrete commitments from the bodies referred to in sub-paragraph (ii) above. We have already had a number of meetings with their national heads. Business In The Community and The Prince's Trust are also eager to help as much as possible. Everybody is determined that the Scheme should succeed.

7. We should make it clear that Multimedia Exhibitions will make no pecuniary gain from this—once the Scheme is up and running, and such sponsorship as will provide for a small administrative office has been obtained, it will be made completely independent of this company. Charitable status is being applied for, and Clifford Chance, the City solicitors, are kindly performing the initial work for the Scheme free of charge.

8. One must be practical and recognise that, apart from the Scheme's obvious philantropic component, donations will carry great PR value for the donating bodies. The latter will be allowed to badge the computers, and are welcome to arrange press coverage of a ceremonial handing-over of them to the educational establishment(s) in question.

Our experience has been that, while of course potential donors want to benefit pupils and students, they also want convenience and PR. The latter is obvious, the former is also an important point—it is easy for a company to engage a contractor to collect outgoing computers and dump them. Some organisations prefer to auction them internally to staff. We are trying to show that it is far better for bodies to have the convenience of the Scheme simply collecting the computers, and for them to be benefiting education, and for them to be gaining a PR opportunity.

We understand that it is Government policy that departments must get some financial return from outgoing computers, whether by resale to users or by simply selling them to a dealer who will cannibalise them. This attitude is depriving educational establishments of access to an enormous pool of resources that would, ironically, save the Government much money.

9. All participants in the Scheme agreed that there should be a dry run before the real thing. It was conducted in Tower Hamlets LBC in February 1996 and went off without a hitch. While not suggesting that Tower Hamlets is typical of the country as a whole, some of the schools there had a computer-to-student ratio worse than 1 in 200, which shows how bad the problem is in some areas.

10. The Scheme has already received detailed applications from nearly 8,000 educational establishments in the space of a few months. Of course some, especially in the private sector, are already quite well provided for, but the vast majority lack what any sensible person could call proper IT provision.

11. There has been considerable media interest in the Scheme, as Appendices 5 and 6 show (*not printed*). As a result we have received a considerable number of offers of computers, including 486s. We have not yet made a concerted effort to solicit donations, so this shows that there are plenty of machines available and plenty of companies willing to donate them.

12. So far as sponsorship of the Scheme is concerned, this company[6] has already put in about £80,000 in cash and kind. We are negotiating with various bodies, public and private, to secure enough money (about £250,000 in the first year) to establish an administrative office, and it is likely that we will get it.

13. We are also negotiating with organisations to provide free or discounted operating software (Microsoft Windows or similar) and network cards in every machine that the Scheme puts in. This will represent another big cash saving for recipient establishments.

14. It is obviously important that computers be properly checked before the Scheme delivers them. To this end we are getting an allocation of man-hours from local authorities' IT departments. Also, many members of the organisations with whom we are associated are suitably qualified. Further, further and higher educational establishments run computer courses and can provide checkers. As a last resort, it will be cheaper for schools to pay for checking a computer from the Scheme than to buy a new one.

15. It is also important for donors to be sure that there is no legal come-back for them. Our legal staff have drafted appropriate disclaimer forms that will be signed by all parties in all cases.

16. Another facet that is vital is that of training and, perhaps more importantly, attitudes. It is a fact that in many establishments, especially in primary and small secondary schools, IT is the responsibility of one or two members of staff. The rest are not interested and take no interest. This fact is a major bar to the development of IT in education. Training staff in IT costs about £300 per day, a sum that few schools are willing to spend.

As part of the Scheme we are setting up Schools of Excellence around the country in which teachers will be trained free of charge. This is to be partly funded by the Scheme, and partly by a company that deals with teacher recruitment etc.

It is quite extraordinary that, while use of IT is mandatory in the curriculum, it is not mandatory in teacher training courses!

17. One of our guiding principles is that we are more than happy to co-operate with other charities that work in the same area—we are not interested in competing with them.

18. Many would say that the obvious course is for the Government to sub-contract the provision of lower- and middle-level hardware to educational establishments to the Scheme. It would save it a great deal of time, money and effort. It would also enable it to devote resources to other areas within education. Provided this does not result in recipient establishments having their budget allocations cut, the Scheme would be more than happy to adopt such an initiative.

PRESS RELEASE

"Free Computers for Education"

Multimedia Exhibitions Limited, organisers of the Education Management Exhibition 1996, announces today that it is launching the "Free Computers for Education" Scheme at this exhibition at the end of April.

Companies country-wide are donating computers to the Scheme. They are to be distributed to educational establishments on the basis of need. Thousands of computers are normally thrown into skips and landfill sites each year when companies upgrade their hardware. These machines are perfectly usable and will contribute to the education of children and students across the country, especially the neediest.

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[6] Multimedia Exhibitions Limited.

Representatives of the Royal British Legion, Rotary International, the National Association of Headteachers and the National Confederation of Parent-teacher Associations are part of a nation-wide checking and distribution network. They will also sit on a chain of area committees that will get donations of hardware and supervise the Scheme in their areas.

Business in the Community and The Prince's Trust are supporting the Scheme with advice and their extensive network of contacts. Penny Shepherd, their Gifts in Kind Manager, said "Our research has shown that both schools and all sizes of business have a genuine need for this service. We have been delighted to use our experience of Gifts in Kind donations to assist the launch of Free Computers for Education."

Christopher Harris, interim Director of Free Computers for Education, said "The average secondary student spends less than 30 minutes per week on his or her school's computers. Frankly, this is disgraceful. So much educational material is produced in computerised form these days that we are risking producing a disadvantaged generation. All the more so when you consider how big a part that computer technology will play in their future working lives.

"For example, the Internet is a growing educational tool. But access to it without having the hardware is like having petrol without the car:"

Col Terry English, British Legion Head of Welfare, said: "This is a wonderful initiative that addresses a very real problem. We feel that this Scheme will run for a long time and deserves the wholehearted support of our organisation." Bill Lapham, Rotary International's Head of Community Service, echoed this by saying "We look carefully at all projects that are suggested to us and obviously we have to be choosy. But this one is so clearly right that we are backing it to the hilt."

A dry run has been successfully conducted in Tower Hamlets. One of the schools to participate in the dry-run was the Marion Richardson School. John Rudgley, Head Teacher said "We are thrilled to have been allocated hardware by the Scheme. It is so important for the education of our pupils to have a proper level of computer resources. The staff and pupils all wish to express their thanks to the organisers of the Scheme". Another school to receive equipment in the dry-run was the Seven Mills School. Head Teacher, Mike Thurley, said "A big thank-you to the Scheme. Many schools are desperate to improve the quantity and quality of their hardware, and we are no exception."

Christopher Harris added: "Multimedia Exhibitions is determined to put something back into education and are already sponsoring the Acland Burleigh School Anti-bullying Campaign, and saw this chance to do something for young people in other parts of the country too."

The Scheme is completely independent of any commercial or political interests. It is the first to have the backing of the range of national organisations listed above that are willing to commit themselves to the business people and decision-makers of tomorrow. It will be run entirely independently of Multimedia Exhibitions. Charitable status has already been applied for.

Brian Lee, spokesman for Multimedia Exhibitions, said in summing up: "This idea would never have got off the ground without the support of these organisations. They have really put their backs into it. The great thing is that we have an army of committed volunteers out there, and their individual efforts add up to a huge amount."

The Scheme is to be run in tandem with Inter-Action (Equipping The Future), the well-known national educational charity.

The initial objective is a nation-wide ratio of one computer to 10 students. This will be improved as the Scheme expands.

The Scheme has aroused great interest in the business community, and discussions are already underway with a number of potential donating companies and organisations.

The hot-line number for educational establishments and donating companies is 0181-251 0296.

Letter from the General Council of the Bar

You kindly sent me details of the sittings in relation to the Sub-Committee I into the information superhighway.

One of the major concerns of the Bar is to seek within the United Kingdom the freer dissemination of Statutes, Statutory Materials and Departmental Practice Manuals; together with Decisions by Courts and Tribunals through information technology.

The current response, both from the Houses of Parliament and Government, may be seen within the following:

- Second Report from the House of Lords' Offices Committee.
- First Report from the Information Committee on Electronic Publication of House of Commons documents.
- Statement by the Chancellor of the Duchy of Lancaster on 9 February 1996 in response to Written Question 192 from Mr Peter Ainsworth.

— The various replies given by Earl Howe in the House of Lords to questions set down by Lord Lester of Herne Hill.

This may lead to an assumption that the United Kingdom position now permits an unfettered access to such information through the Internet, etc. This of course, is not the case. There is still in practice a reluctance to make full information freely available. This has a knock-on effect and acts as a brake upon innovation and economic activity in the United Kingdom. Further, seen within the European Union dimension the need to obtain multi-national permission would in itself act as an undue fetter upon the integration of commercial activity.

The essence of our case is that a greater liberalisation, upon the same assumptions underlying USA government policy would, in effect, give a greater stimulation to the UK economy. Further, it would be far more cost effective for the overall administration as opposed to the retention of a piecemeal and individual licensed based system.

A summary of our contention is set out in the enclosed Paper.

The questions stated within the guidance sheet of call for evidence to the Sub-Committee are apposite. These are matters to which we would be happy to respond by oral evidence before the Committee.

What is often lost sight of is that the ease of provision of dispute resolution within the United Kingdom Courts and that the associated advice is a matter of profound importance to the United Kingdom's invisible export earnings. In support, I would simply refer to the enormous work undertaken personally by Lord Justice Saville in drafting a new Statute for the Commercial Court to deal with this type of international work.

I look forward to hearing from you, in due course.

John Horne, Secretary, Bar Services and IT Committee

17 May 1996

Submission by the General Council of the Bar

ACCESSIBILITY AND AVAILABILITY OF LEGISLATION AND GOVERNMENT INFORMATION

INTRODUCTION

1. One of the many topics which fall within the scope of the Committee's present inquiry is the question of public access to statutes and other legislation, and certain other Government material. Other Government material includes, for example, manuals produced by Government departments explaining how the law is interpreted and applied by them. Such matters fall within question 2(i) 'public information' and question 3(v) 'access to Government information'. Of particular interest also are questions 3 and 4, relating respectively to the supply of information services to consumers in the U.K. and the securing of universal access to services provided for the common good, within a commercially competitive market.

CROWN COPYRIGHT

2. Statutes and secondary legislation, and other Government material, are protected by Crown Copyright under the Copyright, Designs and Patents Act 1988 ("CDPA") which came into force on 1 August 1989. See in particular CDPA S.163 which confers "Crown copyright" on any work "made by Her Majesty or by an officer or servant of the Crown in the course of his duties". S.164 provides that Her Majesty is entitled to copyright in every Act of Parliament, which subsists for 50 years from the end of the calendar year in which Royal Assent was given. The practical effect of these provisions is that all Statutes are protected by Crown copyright. Statutory Instruments, on the basis that they are the work of employees in Government departments, are protected by Crown copyright under S.163. So far as Statutes and Statutory Instruments and other Government material are concerned, the copyright vests in the Crown. It has in the past been administered by HMSO; after privatisation it is understood that it is to be administered by a 'residual HMSO'.

3. The significance of Crown copyright protection should not be under-stated. Its effect is that HMSO (or the residual HMSO) effectively controls all publication of any statute or other legislative or Government material *in any form and in any media whatsoever.* What is not yet completely clear is precisely what will be the relationship between the residual HMSO and the privatised HMSO. It appears that the privatised HMSO will in the future be in the same position as any other publisher in that, as regards using Crown copyright material in a publication of its own, it would need to seek a licence from the residual body on standard terms and would have no exclusive right. There has been a suggestion that a "partial exception" may lie in the backlist of Crown copyright material already published by HMSO, but no further details are known. It appears therefore that in the area of legal publications the intention is that, subject perhaps to the last mentioned exception, a privatised HMSO should compete on equal terms with other publishers. Nevertheless so long as legislation and other Government material continues to be protected by Crown copyright, the

publication of the law of the land, and information as to how it is applied by Government departments will remain subject to restrictions which may be imposed by the residuary HMSO.

4. In considering the questions before the Sub-Committee a crucial issue is whether the continuation of Crown copyright protection in the law of the land can be justified. The position in other countries varies, but there is some consistency in the overall picture, with the exception of the U.K. and certain other countries having British type laws, including India, Singapore and Israel. In the U.S.A. there is no State copyright in legislation, and the same is understood to be the case in Japan. Some Commonwealth countries have moved, or are moving, away from state copyright protection for their laws; for example there appears to be no such protection in Pakistan, and Australia seems likely to abandon it. In Europe, with the exception of Ireland (where there are indications that copyright in legislation is not enforced) inquiries conducted in recent months have not revealed any country in which the State enjoys copyright protection in legislation. Responses from some 13 out of 15 EU/EEA/EFTA countries indicate that there is no such protection.

5. A matter, which is not of direct relevance to the question before the Sub-Committee, but which may serve to emphasise the fact that the legal position in the UK is out of line with the position in most if not all of the other EU/EEA/EFTA states, is the possibility that the restrictions exercisable by virtue of Crown copyright may fall foul of the competition provisions of the Treaty of Rome, as happened in the case of television programme listings in the Magill cases (Cases C-241/91/P and C-242/91/P) decided last year by the European Court of Justice. There can be little doubt that the residual HMSO will be in a "dominant position" within the meaning of Article 86 of the Treaty, and it would seem very likely that any abuse of such position would be capable of having an effect on trade between Member States. It must be emphasised, however, that the possibility, that Article 86 might be applied in some circumstances, does not remove the fundamental issue, whether material of this nature should be subject to state control, or a right of state control, at all.

6. The European Commission's recently published "*Guidelines for improving the synergy between the public and private sectors in the information market*" refers (in para 18) to Article 2(4) of the Berne Convention, which leaves it to the legislation in the countries of the Union to determine the protection to be granted to "official texts of a legislative, administrative and legal nature". The recommendation of the *Guidelines* is that:

> "The public sector should, to the highest extent possible, make use of the discretion given under Article 2(4) of the Berne Convention to exempt from copyright texts of a legislative, administrative or legal nature. . . ."

7. In the light of the European Commission's recommendations and the information referred to in paragraph 3 above, it is submitted that there is a strong case for removing at least statutes and other legislation from the scope of Crown copyright protection. Similar observations apply to other Government information, in particular the Inland Revenue Manuals and the Patent Office Work Manuals, which explain how Government departments interpret and apply the law. Access to all such information should be unrestricted, and it should be available from any publisher who is willing and able to provide the service, with complete freedom of competition. The role of central Government, in particular in connection with the "Information Superhighway", is to take the steps required to bring this about.

Members of the Bar Services & IT Committee of the General Council of the Bar would be prepared to give expert evidence to the Sub Committee in support of this submission.

John Horne
Secretary
Bar Services & IT Committee
The General Council of the Bar
3 Bedford Row
London WC1R 4DB

Memorandum by Andrew Graham, Balliol College, Oxford

INTRODUCTION

The inquiry established by the House of Lords Select Committee has posed many demanding questions. Research that I am currently conducting for the ESRC into the "Information Superhighway: Market Structure, Access and Implications for Citizenship" (Research Grant L126251017) will cast light on several of these questions. While this research has only recently begun, it is already possible to make preliminary remarks about some of the central questions raised by the inquiry.

The evidence that follows focuses primarily on the role of information in a democratic society and how this flow of information is likely to be altered by the new technology. There are four reasons for choosing this focus:

(a) Earlier inquiries, such as the House of Commons Trade and Industry Committee (1994), have emphasised delivery with the result that there has been too little debate about content.

(b) All democratic countries recognise that the provision of information has public policy implications that are quite different from those raised in the provision of other goods and services.

(c) Beyond the special role that it plays in democratic systems, information has several special economic characteristics that distinguish it from other goods and services. One of these is that information, once provided, cannot be destroyed. In this sense information is a genuine "public good" (or if the information is harmful, such as how to make nuclear weapons, a public "bad").

(d) The Information Highway is at a particularly critical point in its development. As a result there is much that could be done now that will not be possible later. Moreover, it will be argued below, what is required can be done relatively easily and without great cost. It follows that this is an area where a report by the House of Lords could have an especially important and beneficial effect.

Before turning to the evidence itself two other introductory remarks are required. First, the technology that is creating the Information Superhighway is part of a much wider industrial revolution. Whereas the first industrial revolution transformed the ways in which materials were used, this revolution—the digital and communications revolution—is transforming time and distance. It is now just as cheap (and as fast) to send something an enormous distance as to send it a short distance. As a result, new technology is dramatically changing the production process. Activities that used to be in the same place are now completely separated physically, yet in immediate contact electronically. Two particularly dramatic examples are SwissAir that now has its accounting done in Bombay and a set of doctors in Washington who have their typing pool in Bangalore. (The material is dictated in Washington, transmitted over a high speed network and returned, word processed, in a matter of minutes.)

Such transformations are extremely important for the location of work and for the organisation of production. Nevertheless, when considering such changes, a distinction needs to be drawn between, on the one hand, a digital, highway that is transforming the production process and, on the other hand, an information highway. Both are important. Both are changing dramatically. Both use the same technology. However, beyond this, they are very different and they present very different problems. What is taking place in the transfers to and from Bombay or Bangalore is part of the production process, but it is not information. Neither SwissAir, nor the typists in Bangalore nor the doctors in Washington are one iota better informed than they were before.

Several of the questions raised by the House of Lords concern the transformation in production that the digital revolution is creating. However, the remainder of this paper concentrates on "information" in the correct sense of that word. It is information in this sense that matters for democracy and it is information in this sense that presents special problems for public policy towards the content of the Information Superhighway.

The second introductory remark is that in order to think about the relationship between information and democracy it is necessary to appreciate the importance of "common knowledge"—what everybody knows that everybody knows. We take the existence of such knowledge largely for granted. However, it plays a role in society that is more profound and more important than at first it seems. It is more profound because any debate requires some common knowledge (you have to agree what you are debating) and because in modern societies the media is one major way in which common knowledge is created. It is more important because almost all agreements on solutions to problems require the extension of common knowledge. This is a precondition for the solution of many coordination problems in democratic societies. How the Information Superhighway will effect common knowledge is therefore a matter of central importance.

The structure of the remainder of this evidence is as follows. Section I is a summary. It contains the central hypothesis that my research has so far suggested and the provisional policy conclusions that follow. Subsequent sections provide the argument to support in greater detail the claims made in the summary. Section II outlines some of the main economic characteristics of today's information industries focusing on the infrastructure and on the production of information. Section III provides the equivalent analysis for the consumption of information. Section IV sets out the provisional policy recommendations in greater detail.

I. Summary and Conclusions

Preliminary research into the effects of the new technology on the media suggests two main hypotheses:

1. Without appropriate public policy, the Information Superhighway will not provide the full range of information that society needs. Instead information is likely to fall into two categories. On the one side will be high quality private (ie, market generated) information (this will include information that is financed by advertising and information that is sold "per view"). However, because of economies of scale and scope, this private information is likely to be provided by a set of firms that are excessively concentrated. Such concentration of information would be of concern both economically and politically. On the other side will be public domain information, but, like much of the Internet now, this will frequently be of low quality in reliability, coverage or presentation. Above all, neither of these categories seems likely to produce the good quality public domain information that a democratic society requires. There is, in effect, likely to be a "gap" which public policy has to fill.
2. The Information Superhighway is likely to have important, but conflicting effects on common knowledge. On the one hand the new technology will create an enormous expansion in methods of delivery. This will allow specialisation of consumption, but also create fragmentation of audience.

However, if audiences fragment, it will be more difficult either to sustain or generate common knowledge. In particular the benefits of co-ordination mentioned above would accrue only to more circumscribed groups. This will be inimical to the democratic process. On the other hand the interaction that will be possible on many parts of the Highway could, in principle, make knowledge richer and/or more appropriate by passing more initiative in the posing of questions and in the setting of the agenda to the receiver of information. It is too early to say definitively how these two influences will develop, but it is not too soon to start thinking about the possible public policy implications.

The policy responses to both problems—the "gap" in public domain information and the possible erosion of "common knowledge" lies, I suggest, in an appropriate mix of institutions. More specifically I recommend that:

1. Complementary to the private sector's provision of information on the one hand and the multiplicity of individuals providing information free as now on the Internet, there should be a set of public (or quasi-public) institutions responsible for collecting, organising and disseminating high quality public domain information using the new technology that the Information Superhighway makes possible.
2. These institutions should include public service broadcasters, public libraries, public museums, universities (plus the publishing businesses of these Universities), schools, hospitals, and bodies such as the Citizens Advice Bureaus as well as charitable organisations and central and local government. Of course, several of these institutions are already placing some information on the Internet, but the potential remains largely untapped.
3. This public domain information should be financed via the "top-slicing". This involves taking a small fraction of the budget of all Government departments, or all Universities, or all libraries and deploying it centrally. It has been used most effectively to finance the UK's infrastructure in the form of JANET (the Joint Academic Network) and now of SuperJANET. What is now required both to generate a critical mass and to sustain the public arena within which common knowledge is created is that the same should be done for content.
4. Common knowledge should be further buttressed by ensuring that public service broadcasts should be available to all and by all means.

Arguments supporting these conclusions are given in the sections below.

II. THE ECONOMIC CHARACTERISTICS OF TODAY'S INFORMATION INDUSTRIES—THE INFRASTRUCTURE AND THE PRODUCTION OF INFORMATION

The first argument made above was that the provision of privately provided information by the commercial sector is likely to be associated with excessive concentration. In the case of production there are two main factors working in this direction:

(a) The production of information has high fixed costs, but very low marginal costs. This is because technology has made production expensive, but reproduction trivially cheap. Consider, for example, how expensive it was to create Windows 95 or the Reuters Share Price Database or a high quality multimedia learning package and yet how little it costs to copy them. Economists describe this either as economies of scale or as the gap between "first copy" and "second copy". When economies of scale are significant (ie when this gap is large), entry to the market is difficult and firms tend to be concentrated. The new technology has increased this gap and this is almost certainly one reason for the spate of enormous mergers that has been occurring in the last few years.

(b) Information offers economies of scope. Such economies occur when activities in one area either decrease costs or increase revenues in a second area. New technology (in particular the digitisation of all information and the convergence that this is making possible) is greatly increasing this. For example, in the past newspapers and television stations were separate activities. Today, information gathered for a newspaper can be repackaged as a television story. This is a second reason for the rise in mergers.

These effects in production may also be reinforced by the nature of the infrastructure. Here two further factors are important:

(a) There are strong network effects and, in particular, what economists call network externalities. Positive externalities arise wherever a consumer does not obtain the full benefit from a purchase. An example is buying a telephone—everyone else benefits to a small extent because the network is more extensive. These network externalities can justify public policy to encourage the growth of a network so that the wider benefits are realised. Alternatively it may cause firms to try to monopolise the network so that the firm captures the benefits (this is what Microsoft looked as if it was trying to do when it linked the launch of Windows 95 to a special Microsoft network). This process in which a single firm internalises what would have been externalities produces effects both beneficial and harmful. The main beneficial effect is that the size of the network is increased. The main economically harmful effect arises if the concentration of ownership leads to monopoly pricing once the network is established. To this must be added the potentially politically harmful effects on society as a whole through the concentration of power that might occur if information is monopolised.

(b) Closely related to network effects are three other phenomenona: critical mass, standard setting and "tipping". The first of these arise whenever a network begins to appear all-pervasive—suddenly everyone wants to join (hence the explosive growth in the Internet since 1993). The second occurs wherever compatibility is important (for example it has long been acknowledged that the Apple design was better than IBM, but IBM managed to set the industry standard and has slowly been killing Apple). "Tipping" is the word used to describe what happens when a market goes suddenly in one direction. The desire for compatibility is one possible cause. For example, when most business on computers is local, incompatible systems can coexist. However, once network business is dominant only a single standard is likely to survive. As this is realised customers all "tip" towards whichever standard is dominant at the time. Irrespective of its merits "the winner takes all".

The importance of these characteristics is that, taken together, they suggest that the underlying economics of the information industries of the future will create strong pressures towards concentration and monopolisation (though large shifts in the technology may cause the ownership of the monopoly power to move from firm to firm over time).

It should also be noted that such concentration of ownership is wholly consistent with the fragmentation of audiences that is likely to occur simultaneously. The new technology will undoubtedly multiply the delivery mechanisms. Satellite, cable, radio and telephone will all become capable of carrying more channels. However, the economies of scale and scope in production make it likely that, without legislation to prevent it, many channels and many forms of delivery will be within the same ownership. Such effects can already be observed in satellite broadcasting.

While these strong pressures towards excessive concentration exist, one other feature must immediately be recognised. Today's Internet is not at all monopolised. Millions of people are placing information on it every day and even greater millions are using it to retrieve information. This is occurring for three main reasons. First, the research that led to the Internet came primarily from public funding. The result is that it has totally open standards. Second, important parts of the backbone of the Internet (such as the National Science Foundation network in the USA and the Joint Academic Network in the UK) were also publicly funded. Partly as a result no single organisation owns the infrastructure. Third, and most important for the longer term, much of the content of the Internet is extremely cheap to produce. This is because the cost of generating some kinds of information (most obviously personal information or personally created information) is very low and because, psychologically, people appear to value self-promotion and/or participation (so labour costs are zero).

The result of this collapse in costs is that the new technology is generating a multiplicity of new players. However, often the new sources are not embedded within any stable institutional framework and/or are without the implicit codes of professionalism that characterise existing reputable sources of information. (As is shown below information sells largely on reputation.) Much of the information on todays' Information Highway is therefore misleading or hard to understand. There are, for example, plenty of "home pages" that have been left abandoned (I can identify several of these for my own University) and there are many others where anyone with specialist knowledge can easily see that lists of information are incorrect, incomplete or out of date. Indeed even the Government fails to say on many of its pages when the information was last revised. Of course some of these problems are transitional and new and/or better forms of information will eventually appear. In addition users will gradually find which sites are reliable and which are not. In other words Internet reputations will emerge.

Nevertheless in the absence of a public policy for such information it is highly unlikely that all these problems will disappear. This is partly because information is difficult to authenticate—a rotten apple is far more obvious than rotten information. As a result poor standards take a long time to eradicate. in addition, at present, many public bodies do not have the necessary incentives to place high quality information on the Information Superhighway. I return to this point below.

It is too soon to say how the Information Superhighway will evolve in the light of these two pressures—towards concentration on the one hand and towards a multiplicity of small players on the other hand. Nevertheless, the following developments seem likely:

(a) There will be an increasing demand for high quality information. Such information will need to be instantaneously available, totally up-to-date and well organised. Most of such information will be commercially provided and the new technology will make it both more easily accessible and much cheaper than in the past. However, the enormous economies of scope and scale that are also created by the new technology make it probable that this private information will be concentrated in the hands of a relatively small number of global multimedia companies. The recent emergence of "intranets" (where information is exchanged using the technology of the Internet, but behind the firewall of a commercial company) reinforces the concern that information will increasingly be privatised. Such concentration and privatisation would be of concern both economically and politically.

(b) Alongside this there will a growth of information that is in the public domain. The new technology makes the publication of certain kinds of information extremely easy—anyone can publish their "home page". Thus an Internet-like world seems likely not only to continue, but to expand. However, such information, being provided free, would frequently be of low quality (just as much of the Internet is now).

(c) As channels of delivery increase, media audiences are likely to fragment. If so, "common knowledge" will decline and the benefits of coordination mentioned above would accrue only to more circumscribed groups. Common knowledge would be further undermined if the information that was in the public domain was of poor quality.

Taken overall, on one side there would be a small number of commercial information providers (almost certainly wielding excessive power and charging possibly excessive prices for important information) and on the other side would be a public domain system, but with highly fragmented, incomplete and possibly unreliable information. Each of these problems would need to be addressed.

III. THE ECONOMIC CHARACTERISTICS OF TODAY'S INFORMATION INDUSTRIES—THE CONSUMPTION OF INFORMATION

Information also presents unusual problems for public policy seen from the standpoint of the consumer. Five features should be mentioned:

(a) Information cannot be sold in the normal way. This is because of the familiar paradox that in order to know how much to pay for information I have to know what it is, but if I know what it is I do not need to pay for it! In practice many markets in information do exist, but they depend critically upon reputation. People buying information either know from prior experience that the information will be valuable (e.g. the services of many of them are new and thus have no reputation). They are also much more transient (web sites come and go).

(b) Markets work well when consumers know their own preferences. However, information, especially information provided through the mass media, has the very special characteristic that the information may itself shape preferences. Two examples will make the point. Many services that we expect to find in the Information Superhighway will be educational (especially taking "education" in the broad sense). However, one purpose of education is to expand how we "see" the world. It is therefore improbable that a person's preferences after education would be identical to those held before the education. Second, it has frequently been argued that television has the power to generate new images of society and that our sense of our own identity derives in part from such images and how we relate to them. Television provides not only the hard facts, but also many of the fuzzy categories—the social, ethnic, psychological, etc., concepts within which we make sense of the world. If so, the demand for the media is, at least in part, a function of the demand that the media itself creates.

(c) Often the right information can only be obtained if you know the right question. (The problem is brilliantly illustrated in the "Yes, Minister" series by Sir Humphrey's ability to control his Minister). In much of society we tackle this problem by placing information in the hands of people, such as teachers, who have both a duty and an ethos to pass it on. Whether commercial providers of information can or should be trusted to do the same must at least be open to doubt.

(d) As already mentioned, in order to function society requires "common knowledge". But how does this knowledge come about in the first place and how is it authenticated? Again, education has a special part to play, but there is also a role for (a) a responsible media and (b) a public space in which supposed facts and opinions are tested in debate. One main case for public service broadcasting is that television is today the main public arena within which common knowledge is generated.

(e) The provision of information is not reversible. Once something is known it cannot be unknown. Often this will be beneficial (e.g. information about health) but in a small set of other cases it may be harmful (e.g. the publication of information about making bombs). Helpful information is therefore a genuine "public good". It should be noted that, because information is often difficult to authenticate, even false information can have a long life—far more so than many other goods and services. Good quality information therefore has a special value to society.

IV. PROVISIONAL POLICY RECOMMENDATIONS

The analysis above suggest that the three main policy problems that the Information Superhighway seems likely to generate are:

(a) the "gap" in public domain information;

(b) the potential concentration of power; and

(c) the possible erosion of "common knowledge".

The primary solution to all these lies, I suggest, mainly in an appropriate mix of institutions combined with the right kind of financing. More specifically I recommend:

Public Providers

Complementary to the commercial sector on the one hand and the multiplicity of individuals placing information on the Internet (or its successor) on the other hand, there should be a set of public (or quasi-public) institutions responsible for collecting, organising and disseminating high quality public domain information on the Information Superhighway. The main purpose of these institutions would be to provide via the new technology the core information that a democratic society requires.

These institutions should include public service broadcasters, public libraries, public museums, universities (plus the publishing businesses of these Universities), schools, hospitals, and bodies such as the Citizens Advice Bureaus as well as charitable organisations and central and local government.

Of course, several of these institutions are already placing some information on the Internet, but the potential remains largely untapped, because they do not have the appropriate incentives to do so. The Government is allowing all public sector bodies to decide separately what they wish to do[7], yet this ignores almost all of the special characteristics of today's information industries mentioned above. Much public information will exhibit critical mass, have beneficial externalities and contribute in important ways to common knowledge, but these are all effects that will be undervalued by each institution deciding on its own.

It should be emphasised here that there is enormous potential in this area for the UK both to enhance democracy and to expand the role of UK institutions. Despite the erosion of the UK's reputation in recent years, British Universities, libraries, publishers and broadcasters continue to be respected throughout the world. Moreover, english is now the world language. Added to this, the UK has a vibrant media and software industry. The Information Superhighway is a global phenomenon. It would be insane if British institutions were to miss a major opportunity by failing to provide the public information that the information society so obviously requires.

Moreover, both Britain and Europe lag behind the USA in this field. So far European debate has been almost entirely dominated by discussion of industrial policy. Little attention has been given to the role that public information could play as a driving force in the development of the information society.

The "Public" Arena and the Creation of Common Knowledge

Good quality public information provided by public (or quasi-public) institutions would do a great deal to sustain common knowledge. However, this could be further buttressed by recognising the importance of there being a public arena within which information is presented, tested and debated in an impartial framework. In the past this has been largely achieved in the UK via the provision of public service broadcasting free at the point of use. There is no reason this approach should be abandoned just because the technology has changed. On the contrary the more that the new world of multiple channels causes the different parts of the UK and different social groups within the UK to go their own way, and the more that differentiation and fragmentation rise, the stronger is the argument for public information and for public service broadcasts being available to all and by all means.

In practical terms what this means is legislation should ensure that public service broadcasts that would be provided free at the point of use by either the BBC or by the ITV companies should also be available free on both cable and satellite. This implies that the Government should be passing legislation placing "must carry" obligations on the cable operators and "must offer" obligations on the satellite channels. This point is closely related to discussion about the set-top box (or conditional access providers as they are known). Much of the debate on this point still fails to recognise that set-top boxes (which will be required to translate the digital broadcasts into analogue form) are a potential natural monopoly (see Graham, 1995).

Top Slicing for Content

The proposal for public institutions to provide public information may sound either difficult or expensive or both. On the contrary it would be easy to organise and to finance. It would be easy to organise because, as mentioned, we already have most of the institutions needed and because many of them already have the reputations that are required. It would be simple to finance because this public information could (and should) be financed via the device of "top-slicing". This involves taking a small fraction of the budget of all Government departments, or all Universities, or all libraries and deploying it centrally. It has been used most effectively to finance the UK's infrastructure in the form of JANET (the Joint Academic Network) and now of SuperJANET. What is now required is that the same should be done for content.

From an economic standpoint top-slicing is exactly the right solution. Network industries require critical mass at the centre and they generate network externalities. Top-slicing, by making everyone pay a little to find the core activities, provides for this. What is now required is to use this same mechanism to provide a critical mass of public information. Top-slicing would provide the essential incentive by which institutions (rather than individuals) would become both the providers and, above all, the guarantors of reliable and useful information.

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[7] "It is ultimately for budget holders in public bodies and institutions to judge whether the benefits of these services merit their participation". (Cm 2734 para 12)

Finally it is most important that those UK institutions who already have good reputations in education, publishing and broadcasting should transfer to the new technology now. If it is left later the opportunity will have gone. The time to make these moves is while the Information Superhighway is still being created.

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April 1996

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Memorandum by the Home Office

As requested by the Committee, this evidence highlights, in particular, the distribution of anti-semitic and other racist material across the Internet. It also considers the problems posed by other unsuitable material.

(i) *What is the extent of the problem in the United Kingdom?*

2. Special Branches across England and Wales are aware of the growing presence on the Internet of extremist groups such as the British National Party. The material placed there most frequently reproduces information and opinions which are published legally elsewhere by more conventional means. Therefore, the police do not become involved.

3. Also of concern is racist material which is not produced in the United Kingdom but comes from abroad, particularly the United States. Some of this material might attract criminal prosecution had it been produced in this country but clearly falls outside of the police's jurisdiction.

(ii) *What discussions have the Home Office had with the police and other interested parties?*

4. Preliminary contacts have been made by the Home Office with other Government departments, the police and other interested parties (such as the Institute of Jewish Policy Research). Talks have been exploratory in nature, seeking to define what, if any, illegal activities are specific to the Internet. Ministers have taken an especial interest as a result of representations made to them from several sources.

5. The Metropolitan Police were represented at the recent European Union conference on terrorism and the Internet and a presentation on this subject will be given to the forthcoming national Special Branch conference.

(iii) *What monitoring of this material is carried out in the United Kingdom?*

6. The Metropolitan Police Special Branch and other Special Branches across England and Wales use the Internet for intelligence gathering about race hate material. There is no specific monitoring.

7. With regard to other unsuitable material, the Government has set up an Inter-departmental Group on Obscenity, chaired by the Home Office, which consists of officials from various Government Departments, including the Crown Prosecution Service, and the police. The group has the specific task of monitoring developments in the area of obscenity, and is particularly concerned with emerging trends in computer pornography, identifying any difficulties in enforcement or weaknesses in the law, and considering ways of overcoming them. The group is a useful forum for sharing information and views about the problem of pornography on computer networks.

(iv) *Whether the Government considers any legislative changes are needed*

8. The Internet is an increasingly important source of competitive advantage for UK companies and can be seen as one route into the "Information Society". The growing importance of the Internet means regulation must take account of it and its particular characteristics.

9. Material passing over the Internet is subject to the same laws as material being distributed by other means. The Government is concerned to see whether enforcement of the laws over the Internet raises

particular problems which could be addressed by legislative change and the Government is determined to ensure that our legislation will not lag behind advances made in technology. That is why, for instance, action was taken in the Criminal Justice and Public Order Act 1994 to update some of the existing legal controls on obscene and pornographic material.

10. The Government believes that the Internet's global character means the impact of legislation is difficult to predict. Whilst it is clearly important to continue to enforce the law with vigour, we would obviously wish to scrutinise carefully any proposal for new legislation. Material stored on Internet hosts overseas is available with little more expense or trouble than that sourced from within the UK, and we have to consider the effect on the UK Internet industry, compared to the impact on the availability of illegal material.

(v) *Whether the government has held discussions with the Internet Service Providers about the possibility of self-regulation eg, by cutting off news groups where these are found to be disseminating illegal material.*

11. So far the Government has encouraged the Internet industry to develop a structure of self-regulation. The Internet Service Providers' Association (ISPA) has recently been formed, and is now in the process of developing a Code of Practice. We will urge that this is implemented as soon as possible. The Code of Practice will govern a range of subjects, including the behaviour of Internet service providers when faced with unacceptable material on the Net. The Government supports ISPA's efforts to lead the Internet community towards setting its own house in order and has recently offered partly to fund a post within the ISPA's new secretariat.

12. As the Internet industry begins to mature, the Government wishes the provision of protective software and filtering technologies to become more widespread. These provide individuals with tools so as to ensure that they or their children do not run across inappropriate material on the Net, whilst avoiding heavy handed regulation which could damage the Internet's role as a driver of competitiveness.

13. It is important to distinguish between illegal material and material which is legal but which some would find offensive. Self-regulation is an appropriate tool to address the latter. Dealing with illegal material is a matter for the courts and the law enforcement agencies. The Government notes the dialogue between the police and some Internet service providers and would like to see this developed constructively for the benefit of the Internet and society generally.

Memorandum by the Independent Committee for the Supervision of Standards of Telephone Information Services (ICSTIS)

ICSTIS has been monitoring evidence which the Sub-Committee has received and heard to date and is aware that the issue of content regulation and control has arisen in a number of contributions.

For example, in the evidence given by the Cable Communications Association in February, the ICSTIS model of industry regulation in the UK premium rate telephone services sector was referred to.

I enclose a submission from ICSTIS which covers the history of regulation in the premium rate services sector and outlines the regulatory model which ICSTIS has developed. The document goes on to identify the common characteristics of premimum rate, On-line and Internet services which may be useful reference points when considering future approaches to consumer protection in this area.

We hope the Sub-Committee finds ICSTIS' submission relevant and useful to its enquiry and we would be pleased to supplement this with oral evidence, if required.

Baroness Dean of Thornton-le-Fylde
Chairman

31 May 1996

1. ICSTIS AND THE CODE OF PRACTICE

1.1 *Background*

ICSTIS was set up in 1986 to regulate the content and promotion of premium rate telephone services (PRS) in the UK. The Committee consists of 10 members, all appointed in their individual capacities. ICSTIS is a non-statutory body but not a self-regulatory body in the traditional sense—there is no industry representation on its Committee. All members are independent of the industry.

PRS operate on designated codes at specified rates. A list of the current PRS codes and their tariffs is enclosed at Annex I. PRS are provided by independent companies (service providers) over the networks operated by the various telephone companies (network operators).

PRS is a term which describes a particular way of paying for information and entertainment services which are delivered via the telephone. The call charge is billed to the customer by the network operator, on behalf of the service provider. Call charges feature on the customer's ordinary telephone bill. This payment mechanism has contributed significantly to the industry's success since there are no invoicing costs to the service provider and bad debt and administration costs on a high number of small transactions are low. The call revenue from the service is shared between the network operator and the service provider at a previously agreed rate.

PRS were first offered over the telephone network 10 years ago with little provision for consumer protection. At the time, there was considerable public and parliamentary outcry over these services and advertisements for them. Concerns centred on the type of material available (adult services), incidents of high bills and unauthorised use.

Public reaction and the threat of legislation forced the industry, at BT's instigation, to respond and to put in place a Code of Practice. This Code was originally applied by an industry association. However, problems arose with industry members sitting in judgement on one another and poor public confidence in an industry-run Code of Practice. As a result, an independent committee—ICSTIS—was established to apply and enforce the Code and develop a system to handle and adjudicate on public complaints.

This series of events which led to the formation of ICSTIS has, in part, been repeated in the On-line and Internet service sectors.

1.2 *Terms of Reference*

ICSTIS' Terms of Reference are as follows:

> "The role of ICSTIS is to supervise both the content of, and promotional material for, premium rate services and, with the support of the network operators, to enforce a Code of Practice. ICSTIS undertakes the following tasks:
>
> (a) setting and maintaining standards for the content and the promotion of premium rate services, and keeping these standards under review;
>
> (b) consulting the industry and other interested parties before changing these standards;
>
> (c) monitoring services to ensure that both the content and promotional material comply with these standards;
>
> (d) investigating and adjudicating upon complaints relating to the content and the promotion of premium rate services and recommending action designed to achieve compliance where the Code has been breached, which may include the imposition of sanctions;
>
> (e) providing a system for the adjudication of claims for compensation in respect of unauthorised use of live conversation services, and publishing reports on its work at regular intervals and generally publicising its role".

1.3 *The Code of Practice and other measures*

The ICSTIS Code of Practice is now in its seventh edition and a copy is enclosed at Annex II. The Code is subject to regular review to take account of developments in technology and new services, as well as changing public attitudes. The Code is amended only following consultations with the PRS industry, consumer representatives and other interested parties.

The Code contains a variety of general provisions covering the content and promotion of all types of PRS services as well as specific provisions relating to particular types of service such as competitions, employment services and children's services.

The Code is also the means by which services are categorised and allocated to certain dialling codes which enable access restrictions to be applied. For example, the Code requires that adult services can only be offered on the 0898 or 0338 dialling codes. Callers wishing to dial these services have to apply to BT for special PIN code access which is only available to over 18-year-olds.

In addition to the Code of Practice, there are other measures available which offer consumer information and protection. For example, itemised billing, call-barring and early warning when telephone bills show unusual patterns of expenditure.

1.4 *The status of the Code and powers of enforcement*

Contractual relationships exist between the network operators (currently BT, Mercury and Vodata) and the service providers which incorporate adherence to the provisions of the ICSTIS Code of Practice and, therefore, oblige service providers to abide by its provisions.

The interlocking nature of the contractual arrangements in the PRS sector give ICSTIS a powerful range of sanctions (including fines and bans) designed to achieve the right degree of protection for consumers and which are regularly invoked. The arrangement ensures that all users of PRS are protected regardless of whether they are telephone subscribers or not.

A copy of the most recent ICSTIS Case Report is at Annex III. This gives an indication of the type of cases which ICSTIS handles and the sanctions imposed.

1.5 *ICSTIS' work*

The main role of ICSTIS is to respond to and investigate complaints. Some 3,200 complaints were received in 1995—a 31 per cent decrease on 1994. Some 85 per cent of these are complaints from members of the public. The remainder are generated by monitoring. Advertising material and service content are monitored regularly.

In addition, ICSTIS regularly gives advice to service providers and advertisers on Code of Practice compliance. ICSTIS handles between 100–150 enquiries a week which include enquiries seeking advice on the application of the Code of Practice.

1.6 *ICSTIS' Funding*

ICSTIS was established by BT, with the endorsement of the Director General of Telecommunications and the Secretary of State for Trade and Industry.

The network operators who carry PRS support ICSTIS and fund its activities. The network operators contribute to ICSTIS in proportion to the amount of revenue which they earn from premium rate services. The relative proportions are not disclosed to ICSTIS, as they are commercially confidential. Increased competition in the UK telecommunications market will see new network operators starting to carry PRS over their networks. These new operators are keen to be governed by what is seen as a successful model of regulation and are expected to support the funding of ICSTIS.

2. THE PRS INDUSTRY

2.1 *Market profile*

The UK was the first European country to introduce commercial PRS in 1985 and still represents one of the largest European markets—estimated at £260 million in 1994. This represents approximately 30 per cent of the total European PRS market.

The number of service providers in the UK is estimated at around 900. To complicate the consumer protection picture further, many service providers merely act as "bureaux", providing line access facilities on behalf of a large number of "information providers" who market services direct to consumers. For example, a newspaper may wish to run a competition and will contract with a service provider bureau who will provide the numbers and call handling facilities to answer and record entrants' details. The service is promoted and branded by the newspaper.

Due to the nature of the contractual arrangements outlined in the section above, this fragmented and rapidly evolving supply of services is still effectively regulated. Service providers are responsible for the content and promotion of all services operating on numbers allocated to them by the network operator. Therefore, service providers have a direct interest in ensuring that their information providers abide by the ICSTIS Code. Many incorporate compliance requirements in their own contracts with information providers and recover fines which may be imposed if breaches occur.

2.2 *Types of PRS*

The most popular services at present would appear to be information services (weather, sport), competitions, direct response to television appeals/televoting and technical support helplines. Services can be accessed by telephone, videophone, fax or PC.

The services can be categorised as follows:

- conversation services, where a live telephone conversation takes place between two parties (the calling party and the service provider or between two calling parties);
- other live operator services such as information and advice services;
- recorded message services, such as information (weather, travel) and entertainment (adult);
- message exchange services, such as automated answering systems and competitions, where the caller leaves a message on an answering system;
- interactive message services, such as dating services and some competitions, where the caller may interact with a sophisticated system, by way of voice and/or tone signals.

Examples of advertising for these services are available in Annex IV.

Whilst no precise figures are available, adult services are now believed to account for less than 1 per cent of the total PRS market. The shift in the nature of services is a result of a maturing industry, better control over access to services and effective regulation, particularly with regard to advertising. In some other PRS markets in Europe and elsewhere, the failure to address consumer complaints and concerns about the availability of adult material, in particular, has led to the closure of the PRS markets in those countries. For example, services in Spain, South Africa, Italy and Turkey were all closed as a result of a failure to respond to concerns and address bad practice.

2.3 *PRS characteristics*

There are a number of characteristics of PRS which are not dissimilar to On-line and Internet services, for example:

speed: access to premium rate services is immediate and service is delivered on-demand;

anonymity: the premium rate service provider and information provider are rarely identifiable or recognisable to the caller. ICSTIS acts as the main point of reference and, in effect, brokers the relationship between the buyer (the caller) and the information sellers (the service and information providers);

scale: there are between 15,000 and 20,000 premium rate services on the telephone network in the UK at any one time run by 900 service providers, with many more information providers beyond this;

diversity: there are low barriers to entry to the premium rate services sector enabling a diverse range of providers from the large company (for example, a media company) to the one-man band;

transborder reach: the ability to call overseas at reasonable rates has never been greater. This has caused some premium rate service providers to move off-shore to places such as Guyana, the Dutch Antilles and Hong Kong—a move prompted by the desire to avoid regulation;

novelty: as technology develops, so a wide number of new services develop. For example, the use of the premium rate payment mechanism to access bulletin boards and the Internet has increased significantly over the past few months.

3. FEATURES OF ICSTIS' SYSTEM OF REGULATION

The service characteristics described in Section 2 above, have influenced the approach which has been taken to develop an effective and responsive system of regulation.

There are a number of principles which guide the system of regulation which ICSTIS applies:

speed of response: services can be started up at relatively little cost and disappear from the telephone network very quickly. ICSTIS' complaints procedures allow for a quick response and are tailored to differing circumstances and pressures. For example, services can be removed in a matter of hours if the issue raised is serious and requires urgent remedy.

Medical advice services which give inappropriate advice or are given by non-medically qualified staff, or services which might encourage dangerous practices, for example by glorifying drug-taking, are examples of services which would call for this type of quick response;

simplicity: making a complaint to ICSTIS is simple and free of charge. ICSTIS accepts complaints by telephone and 73 per cent of the 3,200 complaints received in 1995 came via the ICSTIS free complaints line (0800 500 212). ICSTIS also accepts complaints from any party (including third parties) and does not reveal the identity of complainants;

effectiveness: often, the criticism of industry regulation is that it works for those who agree to be bound by it. Where compliance breaks down, decisions have to be enforced. The unique powers and sanctions that derive from ICSTIS' contractual arrangements have been significant to effective regulation in the premium rate services sector;

flexibility: this is perhaps the key principle and has been cited regularly as one which should guide any approach to regulating new On-line or Internet services and media in order to ensure that the approach best fits the product or medium and does not stifle growth and innovation.

In practice, the development of new PRS technology and services has been such that, without any flexibility in determining the standards and amending the Code to take account of these, regulation would have quickly become irrelevant and difficult to apply.

The Code is kept under constant review and is regularly updated. On one occasion, the Code was amended within the space of three weeks to deal with a situation which seriously threatened public protection and the industry's reputation. This is the exception but the flexibility was present, enabling ICSTIS to act quickly.

4. THE INTERNATIONAL DIMENSION

Over the past two years there has been a rapid increase in the development of international PRS. Companies seeking to circumvent national regulations have based themselves off-shore and supplied services into the UK—these have mostly been adult services.

ICSTIS has approached this issue in two ways:

- by applying the Code of Practice to services available and promoted within the UK. This has been achieved by working in collaboration with BT, the main international traffic carrier, to persuade foreign network operators to impose this requirement on their national service providers; and
- by leading an initiative to create a forum of similar regulatory authorities across Europe to share information, debate issues and represent concerns collectively. For example. a communiqué was issued by the forum recently to the ITU (International Telecommunications Union) calling for it "to examine ways in which the ITU can enable audiotex regulatory authorities to apply consumer protection measures to 'off-shore' services, in the same way, and with the same effect, as those applied to similar services operating from within their territories".
- A further initiative in which the forum of regulators has been involved is the development of regulatory guidelines for transborder premium rate services in anticipation of services being available across borders. Some 13 countries contributed to the development of these guidelines under the aegis of the European Information Industries Association (EIIA) and DGXIII. The guidelines establish minimum standards for transborder services and were agreed in July 1994. A copy is enclosed at Annex V.

5. On-line services and the Internet

There are a number of non-statutory initiatives which are being taken to offer consumer protection for users of Internet and On-line services, both in response to public criticism and concern and in a bid to pre-empt legislation. The following paragraphs comment upon some of these approaches:

5.1 *Content filtering and rating*

A number of technological solutions employing screening software to filter access to material on the Internet have been developed and are being widely promoted.

Filtering mechanisms have been employed in the PRS sector, for example by allocating services to codes and offering customers call-barring facilities to block these. However, these have not been widely promoted and, therefore, the take-up has been relatively low.

The most recent screening application for the Internet to receive attention is the Platform for Internet Content Selection—PICS. PICs is a worldwide industry initiative and, combined with a rating system, enables individuals to screen material on the basis of their personal profile. The system is dependent on content providers rating their own material or on third parties rating material.

These approaches clearly have their attractions, as ICSTIS has reflected in its submission to Oftel's recent consultation document "*Beyond the Telephone, The Television and the PC*" (June 1996): "Giving consumers information about services and providing tools with which to manage their own (and their families) patterns of consumption, are two of the most powerful measures which are likely to achieve consumer protection."

However, as the developers of these solutions themselves recognise, they are not foolproof and can be subject to abuse. For example, the pressure to rate material in order to ensure that it can be widely accessed may force some content providers to mis-rate material in order to maximise opportunities for it to be accessed. In the PRS sector, the fact that access to adult material is restricted to certain codes has led some service providers to try to mask material and present it as something other than an adult service so as to avoid the tighter restrictions which apply. At present, it is not clear how users will be able to register companies if content on the Internet is mis-rated or what action can be taken against content providers who may abuse the rating system in this way.

There are a number of rating systems which are now available. A number of issues and questions about these remain unanswered. For example, will rating systems profilerate and how will users be able to objectively rate the rating systems? How universal are these systems and how can cultural and religious considerations be taken into account? What is to prevent a rating system from being developed by someone for undesirable and publicly unacceptable purposes, for example a rating system to promote access to illegal material.

5.2 *Codes of Practice and industry guidelines*

The UK Internet and On-line service providers have been working on a voluntary Code of Practice. This initiative has received support from the DTI.

Similar initiatives are being taken by industry representatives in Scandinavia and, most recently, in France after a number of publicised arrests in early May.

Industry initiatives are to be encouraged. However, the same issues may arise with these as did with the early regulatory initiatives in the premium rate services sector. For example, concerns among service providers over the independence of the decision-making process and questions about public confidence in the complaints system and the ability to enforce compliance.

A further question which arises in relation to Codes of Practice is about how they can operate effectively in an international environment. Interestingly, there have been some recent calls from the French to develop international guidelines for the Internet.

6. CONCLUDING REMARKS

No doubt many measures will emerge as the challenge to identify an effective solution to content regulation and control intensifies in an attempt to overcome consumer concerns and pre-empt legislation.

It is unlikely that one single solution will present itself as the "killer application" for regulation and control. It is more likely a package of measures will develop which perhaps combines the best of what technology has to offer with the strengths of an effective and flexible Code of Practice and system of industry regulation.

As this paper demonstrates by setting out ICSTIS' experience in regulating the premium rate services sector, new solutions and forms of regulation have already been developed and applied successfully to the rapidly developing uses of the telecommunications network.

Memorandum by the Law Society of Scotland

The topic of the Information Superhighway has been considered by the Law Society of Scotland which has the following observations to make:

QUESTION 2:

The list of headings in question 2 should be extended to include "legal information". The development of the "Information Superhighway" has the potential to greatly improve access to and understanding of the law. The inclusion of legal information reflects the importance of access to the law.

Development of the "Information Superhighway" is anticipated in the following areas:

(i) Official reports of all Civil and Criminal cases, Statutes and Statutory Instruments should be available on public library databases—free of charge. To render the information more intelligible, it is suggested that the Statutes should be annotated and include references to any amending legislation. If the user wishes to print or download the information to their own system, a minimal fee would be payable.

(ii) Realisation of the full benefits of the information superhighway in the legal context, rests in part, upon the adoption of a coherent and integrated information systems strategy between the various agencies of the judicial system. The recent announcement by Lord James Douglas-Hamilton MP, Minister of State at the Scottish Office, of the development of computer links between the Scottish criminal justice organisations is one step in this direction. The advantages in terms of faster handling of queries and responses, reduction of paper exchanges and improved accuracy of records, are obvious.

(iii) In light of the recent Report by the Hon. Lord Cullen (Review of the Business of the Outer House of the Court of Session), use by the courts of information technology, is expected to be considerably extended. Implementing the recommendations of Lord Cullen will enable progess with every case to be more efficiently monitored; defaults to be identified; cases to be allocated to judges; interlocutors, minutes of proceedings and standard letters to be generated; practitioners to obtain information about their cases; and statistics to be compiled.

(iv) CyberNotaries, the development of "trusted third parties" in respect of Electronic Data Interchange and digitalised signatures.

QUESTION 3:

It is suggested that the provision of either the hardware or the software should not be concentrated in the hands of one or two suppliers. The creation of a monopoly type situation would be prejudicial to the public interest and regulations will be required to promote and protect fair competition.

QUESTION 4:

Central Government has a key role to play in the development of the information superhighway in terms of allocating resources and regulating users and service providers.

I hope this is of use to the Committee.

Michael P. Clancy
Deputy Secretary, Law Reform

25 June 1996

Memorandum by the Museum Documentation Association

As Chief Executive of the organisation which gives advice to museums concerning the management and use of information-about-collections, I would like to offer some thoughts towards your enquiry.

For simplicity sake I enclose contributions we have made to the Department of National Heritage at various points in the last year when they have been thinking about policy towards the information superhighway (*not printed*).

Is the enquiry going to look at the role of the Lottery funding in this Area? The MDA bid unsuccessfully to the Millennium Commission for a project to put UK museum collections on-line. We were unsuccessful, in common with most (all?) similar projects such as the one emanating from the Libraries Association, the Open University, and the Norfolk Technopolis bid.

Dr Wendy Sudbury
Chief Executive

22 May 1996

Supplementary memorandum by the National Association of Citizens Advice Bureaux

I promised to let the committee have further information about the London "Link" Project.

I am pleased to attach the information.

Barry Garlick
Information Technology Manager

14 June 1996

LINK

London Specialist Support Units CAB Closed Conference.

LINK

Link is an on-line computer initiative by Legalease (legal publishers) a commercial organisation providing printed information to the legal profession. The "open" LINK (Legal Information NetworK) system enables solicitors to access company reports, law databases, bookshop ordering facilities but all on a chargeable basis. There are also a number of legal discussion fora.

LINK is not on the Internet (but see below) and is basically what used to be referred to as a Bulletin Board Service (a computer which allows you to dial into it via a modem and type commands to download information), however now runs within a Windows graphical environment, which is a much more user friendly interface.

SETTING UP THE PROJECT

The London Money Advice Support Unit have access to the full LINK system and in discussion with the London Computer Development Unit and LINK management concluded that renting secure space on LINK could provide an electronic communication training ground for London Citizens Advice Bureaux, some of whom already had access to modems (12 approx).

A secure conference area was set up on LINK with the assistance of a grant of £2,800 from Thames Water. This allowed a private site to be set up (which cannot be seen by other LINK users) and negotiate the initial connection of 30 London CABx.

Interest was overwhelming and we soon had 45 CABx wishing to participate, even though the additional CAB were required to subscribe (£50 per annum) and in some cases purchase a modem or/and install a new telephone line.

E-MAIL

The whole conference system is based around electronic mail (e-mail). The system allows CABx to send e-mail to each other, to the London SSUs and into a number of "discussion" folders, without charge. The e-mail system allows computer files to be attached, forwarded and printed via simple controls.

FOLDERS

The conference comprises a number of folders (London Division, Money Advice Unit, Computer Unit, Welfare Rights Unit, Social Policy Unit and Thames Water). The London SSU folders are broken down into areas where CABx can download caselaw, software, and information items, in addition to being able to post queries, comment and suggestions within a group (eg. highlighting issues which need to be considered on Parking Fines).

The Thames Water folder comprises company contact information, a copy of their code of practice and a copy of their water debt leaflet; CABx can download these items, as required.

The folders also act as an archive. Files needed today can be acquired but those which are of interest can be left on the server for future interest.

The Future

London CDU have been awarded a grant of £15,000 from the Bridgehouse Trust to develop the idea and connect the remaining CABx in London to the system. Funding is dependent on there being a CDU team (funded by LBGC to overview the project).

If the unit is re-funded we will be aiming to have all London CABx (95 approx) connected by the summer of 1996.

Internet Mail

We are also negotiating with LINK around their new software (LINK'96) which would provide an off-line reader, local telephone call access and internet e-mail address, for free.

If successful London CABx could not only e-mail other members of the secure system but anyone who has an e-mail address eg. Peckham CAB could have the internet e-mail address peckham_cab@link.org.uk.

This would be a very exciting development as it would provide London CABx to have the ability to send/receive e-mail to local councils/libraries, solicitors, other voluntary sector agencies, even the public, as they go on-line.

CABx Outside London

A number of CAB outside London have already expressed an interest in joining the project. However, at present, local telephone call access is only available in the London area (which ensures cheap electronic communications). This will change as after May'96 LINK will be providing national access at local call rates.

This will enhance the attraction of the system ten fold to other CABx because after their initial subscription fee of £50 they will only have to pay for their telephone calls (the £50 fee is approximately 30% of what other service providers would charge for connection to the Internet).

Conclusion

LINK has already proved its worth for caselaw transfers and information provision. CABx can safely use the system knowing that it is confidential to CABx staff. In addition, managers don't have to worry about well meaning advisers downloading inappropriate materials from the Internet or material for which the CAB will be charged eg. caselaw.

Stuart Davidson
London SSU On-line
c/o London MASU

Thursday 9 May, 1996

Memorandum by the National Consumer Council

THE INFORMATION SOCIETY: GETTING IT RIGHT FOR CONSUMERS

I enclose a copy of the above report which the National Consumer Council has published today (*not printed*).

This report looks at the changes in technologies in the information, broadcasting and telecommunications industries and how they are increasingly converging. It then examines what these changes might mean for domestic consumers, including those in disadvantaged groups. It is clear that there is great potential for these changes to enhance people's lives and open up opportunities for those who cannot presently participate fully in society, such as groups of disabled people. However, the very enormity of the changes could exacerbate the position of already disadvantaged consumers if they are excluded.

NCC argues that the consumer should be the top priority in the regulation of these technologies to ensure they bring benefits to everyone. Some of our specific recommendations are as follows:

- The Government should conduct a fundamental review of the regulatory structure for the communications and broadcasting industries. It should consider whether a single regulator should be set up to cover broadcasting, telecommunications and information services. The Government has already indicated that they may conduct such a review for broadcasting and telecommunications during a Committee Stage debate in the Broadcasting Bill in the House of Lords. Such a review should be conducted urgently and embrace wider issues of communications technology.

- A regulatory regime should ensure fair pricing systems, freedom of choice of services for consumers and full public availability of tariff information on an easily comparable basis.
- New independent consumer organisations in telecommunications and broadcasting to represent the consumer interest should be set up. They should be able to conduct research, handle complaints and defend the consumer interest in negotiations with industry, government and regulators. The proposed merger of the Broadcasting Standards Council and the Broadcasting Complaints Commission in the Broadcasting Bill offers an opportunity to improve consumer representation in broadcasting.
- The concept of universal service obligations should be extended to all consumers. Oftel is currently proposing that universal service could be extended to provide multimedia services to all school age children. NCC believes ways should be found to extend this to others by community access points, and to disabled people in their homes.

The conclusions and recommendations of the report are set out between pages 3 and 14.

Hazel Phillips
Senior Parliamentary Officer

11 April 1996

Supplementary memorandum by NatWest

By way of my colleague Steve de Looze's letter to you of 13 May, we agreed to furnish the Select Committee with some further information concerning fraud and security within payment systems.

Steve's contention, within his oral evidence to the Committee, was that the risk in passing card details over information superhighway networks such as Internet is not qualitatively different to the risk attaching to passing those same details in telephone/mail order (transactions termed "cardholder not present" [CNP] within the card industry).

The Committee Chairman specifically asked whether there was evidence of fraud arising within CNP. The following fraud figures were announced for 1995 by the UK card issuers:

Total loss of £83.3m—broken down as follows by place of loss:

UK, of which:	£62.1m	(75 per cent of the total)
ATM	£3.5m	(4 per cent)
Bank counter	£4.8m	(6 per cent)
CNP	£4.3m	(5 per cent)
Other retailer	£49.5m	(59 per cent)
International	£21.2m	(25 per cent)

The figures above indicate that, proportionately, CNP remains a relatively small aspect of fraud loss, at only 5 per cent of the total.

Fraud incurred as a result of CNP has, however, continued to grow, despite a general downward trend in total fraud losses. This type of fraud is still a relatively small proportion of the total losses, but with the growth in mail order and telephone-based shopping, both of which have high average ticket values, the payments industry is taking immediate action to prevent losses increasing further in the future. Special authorisation controls are being developed to ensure that transactions at risk are handled consistently by acquiring banks, card schemes and retailers.

Turning to the impact which trading over networks such as Internet could have on the above figures, Steve correctly emphasised the dual requirements of securely encrypting the card detail to prevent interception, and certifying the counter-parties to a transaction, such that each can be assured of the identity/*bona fides* of the other.

Trading over Internet is conducted with a not inconsiderable degree of security already. The browser software which the customer uses in his/her pc to access a retailer site on Internet will typically encrypt card details. The level of encryption—40 bit RSA—whilst not as strong as encryption available elsewhere, is nevertheless generally considered to be adequate to protect data such as card numbers. Estimates quoted suggest that some £500-£1,000 of computing time would be required for a fraudster to decrypt such a message, and even then, the way in which the keys generate a unique code with which to encrypt a number means that only those decrypted data would be compromised. Many Internet servers, on which the retailer sites are located, are programmed such that only incoming secure browsers are able to place orders by passing card details.

Starting from the base outlined above, the card industry nevetheless recognizes that more needs to be done to create a secure on-line environment in which electronic commerce can flourish. As indicated above, 40 bit key lengths are probably adequate to ensure that systematic interception and decryption of card numbers is not economic for the fraudster. However, it is the fact that interception and decryption remain possible which prompts the need for larger key lengths, whilst the software used at both the cardholder and at the retailer's end needs to generate digital certificates, so that the counter-party can electronically verify the identity of the party with which it is trading.

The standard for electronic commerce to which Steve referred will achieve both these objectives. Called "Secure Electronic Transactions" (SET), this standard is being developed by the two principal card schemes—MasterCard and Visa—working alongside a group of software and computer companies including IBM, Microsoft and Netscape.

The SET technical specification is undergoing a process of iteration and revision, whilst the card schemes are turning their attention to the commercial structures required in order to achieve widespread usage of the attendant software and certificate verification procedures.

When the industry is satisfied as to the technical and commercial viability of SET, it is likely rapidly to attain *de facto* standard status for card payment within electronic commerce.

In endorsing Steve's view that such *de facto* standards should be allowed to emerge, before Government seeks to endorse or encourage the process, one area which it might be desirable to accelerate through "encouragement" is that of the exportability of the proposed cryptography. SET proposes to employ 1024 bit RSA, a very strong level of encryption, but one which will require US export approval if it is to become part of a global standard. It is clearly essential to the development of secure electronic commerce that this export approval is forthcoming. My understanding is that the DTI is currently reviewing SET, alongside the US Authorities, but that no statement has yet been made concerning RSA exportability. I also understand that a European Government forum exists which also reviews encryption export restrictions. In light of my understanding that both France and Russia have legislation restricting the use of encryption, it is perhaps important that this forum also reviews SET, if it has not already done so.

I hope that the above comments assist the Committee in their deliberations. I am of course delighted to amplify any of these issues, or indeed to provide further detail on any aspect of card payment, if that would assist.

David Hodson
Senior Manager

20 May 1996.

Letter from the Northern Ireland Office

I wrote to all the Northern Ireland Departments asking if there was anything unique to Northern Ireland which we might wish to bring to your attention and they all responded with nil returns. I did, however, urge them to liaise with their GB counterparts to ensure that any evidence they gave to the Committee would include Northern Ireland's position. Therefore, it is to be assumed that the contributions from GB Departments cover the position in Northern Ireland as well.

L Foster
Rights and European Division

29 April 1996

Memorandum by The Open University

1. *What are we doing*

The Open University has put strategies in place to support the challenge of applying the clear benefits of the Information Superhighway in distance education. The Open University has always embraced new technology from its genesis with broadcast television and in its application of study centre computing, audio and video cassettes and more recently home computing. The new communication technologies provide the opportunity to fundamentally rethink both the course content, pedagogic methods and delivery mechanisms which have given The Open University its reputation as a national and international provider for quality distance education over the past 25 years.

Currently 15,000 (10 per cent) of our students are registered to access on-line services hosted at The Open University or available on the Internet. Most of these students are studying a course with a requirement to access these services but some have opted to register to use the generic benefits that the system offers.

The number of students registered to access these services is expected to rise to 40,000 (26 per cent) by 1998 and further expand to 100,000 (66 per cent) by the year 2000. This figure represents the number of students registered to use the system in that academic year. However, some students will not have opted for registration after taking a course with a communications requirement and others will have graduated. Therefore the cumulative total number of Open University students who will have used and become familiar with on-line services could be as high as 200,000 by the turn of the Century.

A similar picture can be drawn for our part-time tutors. Currently around 1,700 (25 per cent) of tutors are registered on the system and we expect to be training and equipping 500 tutors per year. Therefore we expect that 3,700 (52 per cent) of our tutors will be "on-line" by the year 2000.

Both students and tutors are being taught useful IT skills and are gaining competencies in information management. The tutorial staff are also receiving training in effective teaching using the new communication technologies.

The Open University is committed to provide a range of services to support teaching, administration, counselling and information services. The infrastructure to support national local-rate dial-up access in the UK to those services together with supported access in the European Union Countries is currently also provided by The Open University.

2. *Benefits to home based students*

Students are able to build considerable IT competencies and transferable skills in the important new areas of Information management and collaborative working.

Electronic communications can enhance the sense of community and reduce isolation for home based students. It also provides new methods of teaching and learning involving access to information resources and the possibility of network-based collaboration between students not previously available.

3. *Benefits to the nation*

It is important for the nation to have significant numbers of the population trained and competent in the use of new technologies and for the skill base to be increasing.

There is a window of opportunity where the UK can establish a significant lead in its use of educational technology in all sectors of education. The UK can take advantage of the lead it has in Europe brought about by the innovation and scale of The Open University and the work of other agencies such as NCET.

The improvements in the skill base will improve the competitiveness of small business and the increasing use of the technology will be of benefit to rural and remote communities.

These skills will cascade out into the wider community, especially schools through programmes such as The Open University's Postgraduate Certificate in Education.

4. *Barriers*

The cost to the student is a significant barrier. An expensive computer is required together with a modem. In addition to these equipment costs the telephone charges for access must be paid which can amount to several tens of pounds per year (not an insignificant amount for some students). Currently The Open University provides a national infrastructure to provide access to the services, but it is anticipated that students in line with the population at large will increasingly provide their own access through a commercial Internet Service provider. This would add another significant cost for the student.

The cost to education providers of supplying these services and the infrastructure is of the order of £50 per user per annum. This is in addition to the cost of tutor training and the provision of software and familiarisation material for users and a helpdesk. It can be seen that if the current model is operated The Open University would be spending in excess of £5m to support on-line services by the year 2000. In the current financial climate this level of expenditure is unlikely to be achieved. Several solutions to reducing this expenditure have been considered, some of which would require Government assistance and are outlined in Section 5.

In order to make effective use of the technology students and tutorial staff require training. The tutorial staff require further training on the effective pedagogic use of the on-line services. The high cost of this training is another barrier to the effective use of the Information Superhighway.

The rapid change in technology and applications and the speed at which new markets develop makes it difficult to make effective plans for future use of these technologies. Problems with intellectual property rights and legal aspects of accessing material and publishing individual views could severely limit the potential of such systems.

5. *What Government could do*

The Government could do more to foster a culture which acts against the current "Cinderella syndrome" where delivering relatively low technology solutions at industrial strength to a mass audience is seen as less important than delivering advanced technology to a few. This could be reflected in a change of emphasis in the funding of the HE network infrastructure through JISC and a shift in emphasis in other funding and research agencies.

Solution of the current difficulties surrounding rights clearance and legal aspects of the use of electronic communication and publishing systems needs co-ordination at national and international levels. The scale of the problem indicates that a solution is unlikely to be found at an individual institution level. The Government has an important role to play in leading this co-ordination.

Provision of a national network infrastructure is becoming an increasing financial commitment for The Open University. It would be preferable in an environment of financial restraint to be able to reduce this commitment. The Open University should concentrate its efforts on developing educational services where it already has a reputation for innovation rather than compete with other national infrastructure providers. Recent efforts have been made by JISC to provide such an infrastructure for the HE Sector. However, without financial support such schemes will inevitably cost more through a profit making commercial provider than the current in-house system. Government could advise JISC to redistribute its resources from providing LAN-LAN interconnectivity towards supporting home based learners. Government could also assist in freeing the regulatory framework in the telecoms industry such that companies could offer an "educational services" 0345 number at reduced tariff from the standard service. Similar pressure at a European Union level could assist in bringing down the high cost of international calls for access to the network. This would be a small cost to the telecoms industry in comparison with the benefits it would bring in all sectors of education.

Government assistance with the cost of developing or delivering the training requirements for tutorial staff and students would be beneficial.

The high cost of access was cited as a significant barrier. The Government should seek to encourage schemes which provide "tele cottage" style facilities in the community. This could be led by institutions already serving the community such as libraries, schools and colleges. These institutions would need a broad concept of community, eg broader than "pupils and their parents" for schools.

6. *Impact*

Without Government intervention there is a risk that the Information Superhighway will benefit only those who already have good access to computing and telecommunications, and the impact on education, employment and economic development will be wholly divisive. Alternatively if there is action to secure universal access to medium bandwidth networks, together with widespread local community provision and end-user links to more networks, then education, training and economic development will be opened up to home-based learners, schools, colleges and work-based users in SMEs, as well as in larger companies. The latter conditions require vision and planning rather than extensive resource, but are vital for the future economic growth of the country.

Professor Diana Laurillard
Pro-Vice-Chancellor (Technology Development)

Memorandum by the Oracle Corporation UK Ltd

1. WHAT IS THE CURRENT FORM OF THE "INFORMATION SUPERHIGHWAY", AND HOW IS IT DEVELOPING (I) IN THE UNITED KINGDOM AND (II) WORLD-WIDE? WHAT SPECIFIC PROBLEMS ARISE FROM INCOMPATIBLE NETWORK STANDARDS AND WHY ARE THESE INCOMPATIBILITIES ARISING?

The Information Superhighway is a concept, and there are different views of what that concept means. These views range from restricting the concept to the technologies employed to form the highways (for example phone lines, coaxial cable, fibre optic cable, cellular radio, terrestrial broadcast and satellite), to the use of the concept as a synonym for the Internet and World Wide Web (WWW).

It is perhaps the latter use which is most widely thought of today as being the Information Superhighway. The world-wide explosion of the Internet and WWW community (both commercial organisations and private individuals) together with the applications and services available have focused the world's attention on interpreting the Internet and WWW as the Information Superhighway. The WWW started out supporting text and still graphics (images), but has recently seen the introduction of on-line sound and video. This development has in some respects highlighted the need for increasing the bandwidth of the Internet to cope with the ever increasing numbers in the Internet community and the use to which it is put.

Another view of what the concept can mean can be gained from looking at what the business community itself is doing to develop and exploit the concept of the Information Superhighway. Some of the major business initiatives publicly announced in Europe, North America and Asia during 1995 are outlined in Appendix A.

Analysis of the published information about these initiatives shows that most are trials, intended to establish whether the planned applications are commercially viable or not, and that they vary in the technologies they employ to deliver the products and services to the customer (for example phone lines and fibre optic cable). For those businesses, the defining characteristic of the Information Superhighway is the interactive communication with the customer.

It should be noted that although all these systems can be considered as being Information Superhighways, they don't necessarily work together as an integrated set of technologies and services. This may be for commercial reasons (competition), security concerns (confidentiality) or the proprietary nature of the technologies or standards used. This is in contrast to the Internet and WWW where the standards used (for example TCP/IP and HTML) are publicly available. However the Internet is not currently regarded by most commercial organisations as secure for transacting business over it. Steps are being taken to introduce secure messaging over the Internet including Encryption and Authentication. Until these issues are resolved with world-wide standards, the Internet will continue to be seen and used as a part of the Information Superhighway, rather than potentially the whole.

Networking incompatibilities arise from the different networking technologies used by organisations for their own networking requirements and that used by the Internet. An organisation who uses for example SNA or Novell networking technologies and who wants to connect to the Internet will need to license TCP/IP technology. This requires an investment decision to be made.

2. WHAT SERVICES ARE BEING PROVIDED, AND (SHOULD BE DEVELOPED/WILL BE REQUIRED), WITHIN FOR EXAMPLE THE FOLLOWING AREAS:

(1) *Public information*

The Internet and WWW provides enormous opportunity for the provision of public domain information from Government departments, Public agencies and Statutory Bodies to citizens at a national and local level. Disseminating information via the Internet and WWW is effective and relatively cheap (compared to the cost of using paper for example). The success of such strategies will depend on the access to the Internet being provided at all levels of society. This means encouraging public sector organisations (for example schools, libraries, museums, councils, transportation) to have facilities for the public to access the Internet and WWW. These facilities could for example take the form of Public Cybercafés and Kiosks located at appropriate locations.

Examples of central government (major departments and agencies) providing public information services on the Internet to the public could include Social Security, Education and Employment, Inland Revenue and National Health.

At the local government level examples of public information services available on the Internet could include employment opportunities, housing, social services, council organisation and directories, schools, local facilities (service and leisure), bus and train timetables.

(2) *Commerce*

The business community is becoming very aware of the potential of conducting business on the Information Superhighway and on the Internet and WWW in particular. Electronic Commerce (EC) is opening up new channels and opportunities for business to business and business to customer information, marketing and sales functions. With between 30 to 100 million users world-wide, the Internet has enormous potential for EC.

Thousands of business enterprises have created their own WWW sites or used commercial on-line services to create awareness of their business, market their products and services, process enquiries and process orders.

A good example of EC that is creating a lot of interest is retail merchandising. The Information Superhighway has the potential to transform the way in which customers can buy goods. Home shopping in the US now grosses more than $100 billion—most of it mail order with a fast growing cable and on-line component. Interactive home shopping and other retail services are likely to proliferate.

In the US and to an extent in the UK, WWW sites have been established recreating shopping malls on the Internet which retail a huge range of consumer products and services directly to the customer in an interactive way. These WWW shopping malls provide the opportunity for customers to buy goods from anywhere in the world at any time of their day.

(3) *Education*

The Information Superhighway has the potential to profoundly affect the way in which education of pupils is carried out. Educational institutions will have access to a vast pool of information in university, public and private information databases.

Educational establishments across the country and around the world will be able to connect with each other, providing an interactive learning environment which crosses geographic, language and cultural borders. Removing these boundaries creates opportunity for new ways of teaching and motivating pupils.

For example remote cameras, sound and other devices will enable pupils to participate in learning events taking place elsewhere in the country or world.

Interactive distance learning with pupils learning from a remote location, for example home or a local education establishment is another opportunity that can be realised with the Information Superhighway. The need to be physically located at a particular place to be taught is removed.

The success of such education strategies will depend on access to the Information superhighway being available to all pupils in an equal way. This means providing encouragement for educational establishments to acquire the facilities and knowledge to benefit in the educational process from the Information superhighway.

(4) *Health*

The information superhighway will profoundly alter the way in which medical care is provided and managed. By sharing information, health care professionals will leverage scarce resources to bring more advanced services to more patients at lower cost. The ability to undertake long distance treatments will become common. For example, a person being treated for a brain tumour will be able to undergo a CAT scan at a local hospital and have it diagnosed by neurological experts at medical centres anywhere in the world. The CAT scan is transmitted across the information superhighway, the experts confer electronically, and plan a therapeutic strategy. Via videoconferencing, they can talk with the patient and family, and recommend a course of action.

Hospitals everywhere will be able to share databases of lifesaving information, such as up-to-the-minute lists of patients awaiting organ transplants, or ongoing clinical trials offering innovative treatments.

General health care will become more convenient. Expectant mothers, for example, will be able to join prenatal care classes via two-way links from homes, offices or schools. With the help of special devices, people with special needs will gain direct access to health services. Health care professionals will use two-way video links to diagnose and treat common ailments on-line saving thousands of unnecessary visits, and focusing medical resources where they're needed most.

On the educational front, medical students and health care professionals will be able to enhance their knowledge and skills using interactive distance learning techniques (multimedia and video based training) over the information superhighway. Reducing the cost of education while increasing its availability. Simulation software will enable virtual operations that teach new techniques. Global seminars will bring together students and practising professionals.

(5) *Entertainment*

The information superhighway puts consumers behind the wheel of the most powerful home entertainment vehicle invented to date. Entertainment on demand will give each viewer complete control of what to watch and when to watch it. Thousands of films, music videos, documentaries, soap opera episodes, concerts, news and sports events will be available instantly, 24 hours a day.

To manage this enormous variety of choice, customers will be able to specify what their preferences are. In return, they will receive a personalised electronic menu of entertainment options. For example, action films with PG ratings, sporting events with field and track events, or music programming that doesn't include disco. With a virtually unlimited market, entertainment on demand has the potential to be a major driving force in the development of the information superhighway.

3. WHO WILL SUPPLY THESE SERVICES TO CONSUMERS IN THE UNITED KINGDOM? HOW CAN THE PARTICIPATING COMPANIES BE CATEGORISED AND WHAT IS THE NATURE OF THE COMMERCIAL RELATIONSHIPS BETWEEN THEM? HOW ARE SUPPLIERS LIKELY TO DEVELOP? WHAT *service* STANDARDS EXIST AND HOW ARE THEY LIKELY TO EVOLVE?

Information superhighway service suppliers can be grouped into three distinct areas:

(1) Internet providers—organisations which provide the networking infrastructure, for example the Telecoms and cable companies. Hardware and software manufacturers who provide the infrastructure for storing, managing and viewing the data, for example Web server hardware and software; Web browser software.

(2) Commerce providers—organisations which provide the on-line services for managing electronic money transfers (Cybercash, Digicash) on the Internet.

(3) Content providers—organisations which provide the information content, style and layout of a particular Web site. Content providers may be part of the organisations (for example a marketing department) who owns the Web site, or may be organisations which are contracted to provide content development services.

The Information superhighway suppliers will be comprised of established Blue chip companies and start-up companies, operating individually or collectively to supply the service categories described above. As the market matures, each group will seek to create added value services. For example, the Internet providers could provide content creation as part of their service offerings.

4. HOW CAN UNIVERSAL ACCESS SERVICES PROVIDED FOR THE COMMON GOOD BE SECURED WITHIN A COMMERCIALLY COMPETITIVE MARKET FRAMEWORK?

5. WHAT IS THE ROLE OF CENTRAL GOVERNMENT IN CONNECTION WITH THE "INFORMATION SUPERHIGHWAY" SERVICE PROVISION?

Central government must take an active role in making sure that the UK business community is aware of (and prepared for) the Information Superhighway. The commercial development of the Internet and WWW as a global channel for conducting business has reached a point where it is vital that UK businesses are in at an early stage in order to take competitive advantage of the opportunies offered. If they don't, then they face competition from other countries who do adopt the WWW as a new business channel, and risk losing market share in a global market place.

It is very important that all sectors of UK business (large and small) are given equal opportunity to access the impact of the Information superhighway on their business practises and markets. As a non commercial organisation, central government can promote a balanced perspective on all aspects of commerce on the Information superhighway. It can help to create a level playing field in a competitive UK business environment, undertaking for example to:

(1) The technologies and applications that can be realised today to improve UK business competitiveness both at home and overseas. Setting expectation levels on what realistically can be achieved.

(2) Creating and supporting forums within the UK business community with the aim of spreading the message across a wide and diverse audience. Encourage the early adopters to pull late starters up to speed.

(3) Raise awareness of the implications of international commerce. For example language, customs, export regulations, revenue collection.

(4) Promote open standards both within the UK and overseas. For example, network electronic cash transfer, security and authentication standards.

(5) Encourage companies to invest in electronic commerce, particularly companies who are not already IT users. Provide financial encouragement (for example grants, tax breaks), local training schemes.

(6) Provide favourable regulations and legislation for UK companies to adopt the Information Superhighway as a business channel. Take the lead at a UK and global level in resolving issues which can impede the adoption process. For example intellectual property rights, security, data protection, privacy and censorship.

As a public sector organisation, central government should lead by example in demonstrating the effective use of the Information superhighway. Departmental and agency information and procedures should be available on-line to encourage businesses (and the public) to communicate interactively with Government. For example, completing tax returns, with on-line assistance.

6. WHAT WILL BE THE IMPACT OF THE "INFORMATION SUPERHIGHWAY" ON WORKING PRACTICES AND EMPLOYMENT PROSPECTS?

The Information Superhighway will accelerate the growth of teleworking (or telecommuting). Improvements in mobile computing and communications (telephone access, ISDN) and personal computers (portability and power) have brought about the opportunity for organisations to introduce flexible working practices and environments for their employees, moving the people to work paradigm to one of taking work to people. This has a number of benefits to the employer, the employee and the environment:

(1) For employers; increase of workforce flexibility (permanent, part-time, contractor), organisation flexibility (virtual teams), reduction in office costs, relocation cost, retention of key staff and reduction of staff turnover. Spreading the geographic area that an employer can make up the workforce from (remote rural areas, other countries).

(2) For employees; more flexible working environment in the place of work (home, on the move or in service offices—teleworking centres), choice of commuting distances and journey start times, reduction of stress and better quality of life (more leisure time). Choice of working hours. Opportunity to work for organisations which are remote from home locality (including other countries and time zones). Avoiding relocation issues when changing jobs (or contracts).

(3) For the environment; overall reduction in number of people commuting (by car, bus and train) and the peaks in commuting times (spreading the rush hours over the day). Reduction in pollution levels and noise from cars, and the pressure on the road systems.

APPENDIX A—INITIATIVES ANNOUNCED IN 1995

British Telecom announced a market trial of interactive multimedia services. The trial involves piping home shopping, home banking, interactive advertising, movies, pop videos, computer games, TV programmes and local information services to TV sets in 2,500 homes. Services are delivered to consumer's homes via existing copper lines or, for around 500 homes, high capacity fibre-optic lines. A set-top box provides the added functionality needed to allow consumers to interact with the services provided via their otherwise ordinary TV sets. Reportedly, over 100 companies have signed up to make their offerings available to participating consumers.

Three UK cable TV companies formed an alliance to deliver broadband multimedia services including home shopping, home banking, advertising, education and public information. Their development plan involves carrying out laboratory tests, a technical field trial and market trial involving at least 2,000 homes. It is due for completion in 1996–97.

Deutsche Telekom announced plans to pull Germany's telecommunications systems from 20 years behind to a standard exceeding everyone else's in Europe. A multimedia service to residential users was announced and Telekom said they were running six trials to evaluate the best combination of transmission and set-up box technologies. Services available include home shopping and video on demand. Access points are provided in public places as well as in consumers' homes.

Credit Commercial de France promised a high-tech multimedia banking service for its customers. The service, to be delivered via France Telecom's high-speed viewdata system, will incorporate home shopping and travel booking facilities as well as banking applications.

Hong Kong Telecom announced plans for developing a full multimedia service. An initial service due in July 1996 is to feature video on demand, home banking, home shopping and interactive entertainment facilities.

Singapore Telecom announced plans for launching a nation-wide video on demand service in 1996. Meanwhile, local firm WyWy announced its intention to team up with Brother Industries of Japan and others, to deliver video on demand to closed groups like karaoke chains and hotels.

Leading UK retailers J Sainsbury, Tesco, W H Smith and Dixons announced their presence on "electronic mails": the Internet in the case of food retailers Sainsbury, and Tesco, CompuServe's UK Shopping Centre in the case of others. CompuServe said it has provided shopping services for over 10 years and in the US has over 150 companies offering their wares via its service.

The US's largest food retailer, Kroger Company, claimed to be the first supermarket chain to provide the convenience or home grocery shopping via an interactive Channel on cable TV networks. The channel was scheduled for launch in late 1995.

US computer companies announce new information highway technologies including Oracle Media Objects TM (first multimedia authoring tool for less than $100, form Oracle Corporation); Magic Carpet (set-top box by Silicon Graphics); Java (programming language for World Wide Web servers by Sun Microsystems) and HotJava (World Wide Web browser, also by Sun Microsystems); and Webspace (a World Wide Web browser by Silicon Graphics).

13 US's telecom and cable companies—Ameritech, Bell Atlantic, Bell Smith, Cablevision Systems, Cox Cable, GTE, Nymex, SBC Communications, Sprint, Telecommunications, Time Warner's Full Service Network, US West and Viacom—were reported to be carrying out technical or market trials of interactive multimedia services. Their announced trials collectively included planned or actual connections into 95,000 homes over the next two years or so.

Memorandum by the Performing Right Society

1. This memorandum is submitted by the Performing Right Society Limited (PRS) which is an assocation of composers, authors and publishers of copyright musical works. PRS represents more than 28,000 composers and publishers in the United Kingdom alone. PRS administers the rights of public performance, broadcasting and cable diffusion in their musical works and through reciprocal agreements with similar organisations overseas administers those rights in virtually the whole world-wide repertoire of copyright music. PRS' turnover in 1995 was almost £180 million of which broadcasting and cable amounted to £60 million.

2. We seek to address the following questions in relation to the Committee's inquiry:

> Does the development of an Information Superhighway pose a threat or create opportunities for rights owners; conversely, is it possible that the current rights protection regime could inhibit the development of a public accessible network?

3. The development of an Information Superhighway will lead to great opportunities for rights owners for the following reasons:

(a) Songwriters can disseminate copies of their works to persons such as music publishers or record companies so that those works may be evaluated.

(b) It will provide an opportunity for getting works and recordings disseminated cheaply.

(c) An individual songwriter may no longer need to use a recording company to enable his works to be heard by the public.

(d) In a wider context it will provide an opportunity for asynchronous broadcasting and cable. In other words members of the public will be able to watch or listen to programmes or listen to musical works at the time they choose rather than the time at which a broadcaster chooses.

4. It is also highly unlikely that the current rights regime will inhibit the development of a public accessible network. The only rights available are those under the current Copyright, Designs and Patents Act 1988 and those rights enable the United Kingdom to comply with its obligations under the Berne Convention and are the same as are applied to all other forms of exploitation.

5. PRS believes that the correct copyright regime is in place to deal with the advent of an Information Superhighway. However, this copyright regime must be complemented by an effective enforcement regime. Enforcement is always an important part of copyright because of its intangible nature. This importance is increased significantly in relation to copyright exploitation on the Information Superhighway. Any person controlling one of the millions of internet terminals is both a potential music provider and consumer. This is because that person will be able not only to receive music on the internet but also to transmit it. This greatly increases the possibilities of music exploitation and makes the control of such exploitation extremely difficult. Efficient control is dependent on two factors at least:

(i) Workable identification systems. Such systems already exist in relation to sound recordings ("ISRC"), books and written publications ("ISBN"), and printed music ("ISMN"). Two draft standards are currently being set up by the international organisations CISAC/BIEM for musical works ("ISWC") and by CISAC/BIEM/AGICOA for audio-visual works ("NUI"). Other international standard identifiers are also in the course of development within CISAC/BIEM for repertoires such as still images and literary works.

(ii) Copy management tools. There is already a technical system in place to prevent unlimited copies of musical works, called Serial Copyright Management System ("SCMS"). Building on this system, it is necessary to develop a new generation Active Copy Management System ("ACMS") to enable rights owners effectively to control digital copies made of their works.

Thus, the solution must be a universal and international application of a codified system of works. Both the identifying systems and the copy management tools mentioned above should be incorporated into an international standard which is universally recognised in both legislation and licensing agreements between rights owners and users.

What will be the impact on UK plc of a failure to maintain adequate rights protection?

5. The impact could be immense but immeasurable because no-one has any idea of the extent to which the Information Superhighway will take over as a means of broadcasting and as a means of individual communication. Nor does anybody know to what extent new opportunities will emerge which cannot presently be foreseen.

What new protection will be necessary if a Superhighway is fully developed?

6. PRS does not believe that any new protection will be necessary: the existing rights give it everything it needs to license the works of its members. However it is fair to say that the rights given by the 1988 Act were not written specifically for the electronic context and so PRS does believe that some enhancement of the existing broadcasting and cable diffusion rights will be necessary to ensure that it is clear that they apply in an electronic as well as a physical context.

Distinction between UK and Continental rights concepts—which should be adopted in this case?

7. As we mentioned earlier the rights administered by PRS are the rights set out in the 1988 Act which enable the UK to comply with its obligations under the Berne Convention. The UK and all the continental countries are signatories to the Berne Convention but as is pointed out they have different concepts of rights. What is important is the obligations under the Convention rather than the ways the rights are expressed. We see no particular merit in changing to a continental rights system when, as we have said above, UK rights are perfectly satisfactory subject to some enhancement to deal specifically with the digital environment.

Letter from Reuters

John Horne of the Bar Council has kindly copied to me your letter to him of 21 May commenting on the submission of the Bar Council.

Permit me to comment on the points that you raise about the policy adopted by the House of Lords in relation to electronic publication of parliamentary material. It is possible that Reuters comments may be of interest to members of the Select Committee.

We warmly applaud the decisions of both Houses of Parliament to encourage electronic dissemination of parliamentary material.

However, we believe that both Houses of Parliament have not fully understood the contribution that the private sector could play in accelerating this process. Our understanding of the policies adopted by both Houses of Parliament is that it will be Parliament itself, via its chosen sub-contractor, which will first make available parliamentary material in electronic form. This will have the result that progress will depend upon the speed at which the designated sub-contractor can proceed. As resources are necessarily finite, progress may be slow.

A much more rapid—as well as cost free—solution would be to allow the private sector to itself convert into electronic form all parliamentary material that has already been published in paper form. Scanning technology already exists to make this viable and Reuters, in the context of its European Union briefing service, already makes extensive use of such technology to publish electronically texts of EU documents.

A decision by both Houses of Parliament to enable this to happen would lead to a rapid spawning of private sector electronic publications covering many aspects of parliamentary material. This would be to the advantage not only of Parliament but also to citizen and tax payer.

I would be very grateful for any assistance you can give in bringing this letter to the attention of those in the House of Lords who might be interested in this subject.

Henry Manisty
Head of Government & Regulatory Affairs

29 May 1996

Further letter from Reuters

Thank you for your letter of 12 June.

Section 5.2 of the First Report of the Information Committee of the House of Commons entitled Electronic Publication of House of Commons Documents perhaps best illustrates the point that I am seeking to make:

"Only the Commons and Lords Official Reports and Weekly Information Bulletin are produced electronically in a form which could be placed immediately on the Internet. The availability of other parliamentary documents will depend on the extent to which the two Houses can make arrangements for their electronic publication."

Electronic publishers are seeking permission to convert into electronic form and redisseminate electronically parliamentary documents for which the two Houses make no arrangements for their electronic production, but which are nevertheless inherently suitable for dissemination in this form.

I raise this because it does not seem to be appreciated widely that progress on digitisation of parliamentary material does not have to depend entirely on "the extent to which the two Houses can make arrangements for their electronic production." The private sector can play a role not just in redisseminating/repackaging material made available to it in electronic form, but also in electronic dissemination of material which, for the time being, Parliament itself makes no arrangements for its electronic production.

The policy that we would wish to establish is that any parliamentary material published in printed form should be able to be converted into digital form and redisseminated by electronic publishers.

Parliament and the public would both benefit from such a policy.

Henry Manisty
Head of Government & Regulatory Affairs

17 June 1996

Memorandum by Visa International

Further to your letter of 25 April, we are very pleased to submit evidence to the Committee's enquiry into the Information Superhighway: Applications in Society.

Visa International is an association of 19,000 financial institutions worldwide. Visa develops payment products which these financial institutions can supply to their customers. Of particular relevance to the enquiry, Visa has developed standards to ensure that card payments and remote banking services are secure on the superhighway as in the traditional high street or bank branch. We believe these standards will create the confidence of cardholders and merchants in using their cards in an open environment and thereby encourage the growth of electronic commerce and remote banking.

We have expanded on this matter in the attached submission. We have restricted our comments to those areas where we feel we have relevant expertise.

We would like to congratulate the House of Lords for conducting the enquiry and look forward to reading its report.

11 June 1996

1. WHAT IS THE CURRENT FORM OF THE "INFORMATION SUPERHIGHWAY", AND HOW IS IT DEVELOPING (I) IN THE UNITED KINGDOM AND (II) WORLDWIDE? WHAT SPECIFIC PROBLEMS ARISE FROM INCOMPATIBLE NETWORK STANDARDS AND WHY ARE THESE INCOMPATIBILITIES ARISING?

The Information Superhighway is a transnational, multilingual, multicultural computer network that provides access to all types of information on an unprecedented scale. The fastest growing and most used segment of the Information Superhighway is the World Wide Web ("WWW"), a graphical, interconnected collection of information. In addition to using the WWW to access information, both consumers and businesses are expanding the WWW by adding their own "web sites" that contains information about themselves, their interests and their businesses.

The Information Superhighway is growing organically, but nonexistent or incompatible standards can inhibit this growth. Standards are traditionally developed with industry input by parties with the necessary expertise and interest (see Question 3 below). They are adapted to take account of new technology as it is developed.

For example, until recently, there was no secure method for using payment cards on the Internet (the Internet is the global network of computers that comprises a significant part of today's Information Superhighway). Two characteristics of the Internet that create great potential for payment card fraud are the inability of a person to sufficiently authenticate the identity of another person with whom they are communicating and the ability of a third party to intercept, and possibly alter, messages without detection. On high street, payment cards are authenticated with holograms on the cards, PINs, and signatures. Alternatives to these security mechanisms needed to be created for the Information Superhighway before "electronic commerce" could begin.

To create these security mechanisms, Visa worked with other key industry players (including MasterCard, Microsoft, Netscape, and IBM) to develop an open standard for secure electronic transactions ("SET"). SET allows consumers to use their payment card on the Internet with at least the same amount of security as they have on the high street. The first version of SET has recently been republished after incorporating industry comments. This standard is now publicly available at no cost to any interested party. Independent software developers have already begun to incorporate the SET standard into their software packages with the expectation that product will be commercially available by the end of the year (see Question 2(ii) below).

2. WHAT SERVICES ARE BEING PROVIDED, AND SHOULD BE DEVELOPED/WILL BE REQUIRED, WITHIN FOR EXAMPLE THE FOLLOWING AREAS:

(i) public information,
(ii) commerce,
(iii) finance,

It is nearly impossible to catalog or even categorize all of the services currently being offered on the Information Superhighway, because they are constantly changing.

The types of activities/services on the Information Superhighway can be divided into two broad groups, commercial and non-commercial. The creation and development of commercial activities/services would best be left to the marketplace. Non-commercial activities are probably best left to the community of "travellers" on the Information Superhighway. One need only spend a little time surfing the web to discover that the breadth of activities and services provided is unparalleled.

(i) Governments and commercial entities alike are using the Information Superhighway to distribute information to the public in new and innovative ways. This medium is an excellent, cost-effective mechanism for such distribution.

In addition to establishing and maintaining their own web sites containing public information, governments should consider partnering with other industry players to provide information that will help individuals understand their rights and responsibilities as consumers. Visa is currently offering a free educational program called Choices and Decisions that is geared toward high school and college students that helps them understand the proper usage of credit. Visa has provided the materials to national governments to incorporate in their public education programs. Such public-private partnerships benefit all parties involved, and the Information Superhighway provides an excellent opportunity for their distribution.

(ii) Commerce on the Information Superhighway is probably the most anticipated development of the Internet phenomenon. Currently, the level of commerce conducted on the web is extremely low. The Information Superhighway will create new points of transaction in cyberspace by providing the same utility as the points of sale in today's physical environment. All the elements for commerce currently exist, except for a secure method for payment. As soon as SET compliant software is made available by independent third party software vendors, it is expected that electronic commerce will grow exponentially.

In addition to traditional goods and services, electronic commerce will introduce a whole new category of "digital goods" that will be ordered, paid for and delivered through the Information Superhighway. These digital goods will include software, music, data, graphics, and video. In addition, some predict that electronic commerce will permit the sale of small bits of information at relatively small prices. These "microtransactions" will represent a whole new market and will probably require their own infrastructure, including a specific payment method.

(iii) Everyday new financial services are being offered on the Information Superhighway. Electronic banking, bill payment, and investment management are just a few of the services being offered. The Information Superhighway is an obvious forum for conducting financial transactions, but such transactions require security mechanisms that reflect those used on high street. For example, ATM cards, PINs, and signature are three mechanisms used by banks to provide security for financial services transactions. These mechanisms ensure privacy, data integrity and authentication. Once analogous security mechanisms are created for the Information Superhighway, financial services can be offered safely in this medium.

A number of UK banks have plans to introduce Internet-based electronic banking and remote bill payment services for their customers. Visa is working with some of these banks and other industry players to provide a secure means for offering financial services over the Internet.

3. WHO WILL SUPPLY THESE SERVICES TO CONSUMERS IN THE UNITED KINGDOM? HOW CAN THE PARTICIPATING COMPANIES BE CATEGORIZED AND WHAT IS THE NATURE OF COMMERCIAL RELATIONSHIPS BETWEEN THEM? HOW ARE SUPPLIERS LIKELY TO DEVELOP? WHAT SERVICE STANDARDS EXIST AND HOW ARE THEY LIKELY TO EVOLVE?

Since cyberspace is transnational, service/content providers are not hampered by geography, and geographic boundaries are much less relevant.

Participating companies can be broken up into the following categories: technology providers (software and hardware vendors); content providers (creators and custodians of information and services); service providers (telecommunication companies, payment companies and network providers); and merchants (sellers of goods and services). Many companies fall into more than one of these categories and there are a handful of companies that fall into all of these categories.

The Information Superhighway is a highly fluid environment. Suppliers are likely to be created from many different sources. Since Internet-based startups have easy access to capital due to all of the attention and hype, it is expected that there will be no shortage of suppliers of Internet-based services in the near future.

Service standards on the Information Superhighway are primarily community-based. For example, the standard for the Hypertext Markup Language ("HTML") provides a useful illustration of the evolution of standards, even though it is itself, not a "service" standard. HTML, which provides the backbone for WWW, is managed by the volunteer organisation known as the World Wide Web Consortium (W3C), which is made up of key industry players and other interested parties. Changes and modifications to this standard are proposed by companies and reviewed and debated by the W3C, who is empowered to approve or reject such proposals. Similarly, the SET standard was developed by a group of key industry players and published for industry comment. An extensive dialogue ensued and has resulted in a much-improved standard. It is likely that this pattern of community-based regulation will continue.

5. WHAT IS THE ROLE OF CENTRAL GOVERNMENT IN CONNECTION WITH THE "INFORMATION SUPERHIGHWAY" SERVICE PROVISION, INCLUDING THE FOLLOWING AREAS:

(i) leadership;

(iv) promoting network compatibility;

(vi) security of payment.

(i) Government can and should take an active role in working with the entities participating in the Information Superhighway. This role should be one of promoting and facilitating the utility and growth of this area. Any obstacles or burdens created by government might be bypassed because of the absence of obvious national borders. Government should work to make their country as friendly to cyberspace as possible. Such efforts require active, informed participation. The results are all the economic benefits of the additional business who choose to enter the Information Superhighway through that government's country.

(iv) Network compatibility is critical to sustained growth. All players, including governments, should work together to provide the best possible solutions for network compatibility and network interoperability.

(vi) Payment on the Information Superhighway can either be made through traditional methods (credit cards, debit cards, etc) or it can be made through new methods, like digital money.

It is unnecessary for government to play a role in the provision of secure Internet payments through traditional methods. This task is best left to the payment card industry.

Currently, digital money is either account based or token based. In the case of account based digital money, participants exchange "orders to pay" that are settled with a bank at specific moment in time. In essence, account-based digital money is like an electronic cheque. This type of digital money is analogous to existing methods of payment and probably will not need government involvement.

In the case of token-based digital money, on the other hand, participants exchange bits of data that have inherent monetary value. This type of digital money is more like cash and has the potential to be used many times without being deposited in a bank. This characteristic raises some concern on the impact this form of payment may have over monetary policy.

6. WHAT IS THE ROLE OF LOCAL AND REGIONAL GOVERNMENT IN CONNECTION WITH THE "INFORMATION SUPERHIGHWAY"?

Government should be a facilitator in the growth of this new market. The effect of excessive or improper regulation will be the great reduction in benefits to the citizens served by that government. Governments should dedicate the resources necessary to educate themselves on this brave new world. This Enquiry by the House of Lords is an excellent example of positive participation in the Information Superhighway. With the knowledge gained from efforts such as these, government can promote the growth of the Information Superhighway, thereby providing benefit for its citizens and for the larger online community.

Specific areas that government can address are: removing barriers to using encryption technology that hinder security on the Information Superhighway; passing legislation recognising digital signatures as valid means for entering into contracts; coordinating legislation with other governments to promote growth; updating intellectual property regimes to protect the rights of all entities while not stifling the flow of the Information Superhighway; and expanding the options for access to the Information Superhighway for its citizens.

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